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ARTICLE XXXV.

LIGATURE OF THE CAROTID ARTERY.

By H. WARDNER, M.D., Brigade-Surgeon.

U. S. GENERAL HOSPITAL,
MOUND CITY, Ill., Nov., 30th, 1862.

MR. EDITOR:—I send you the following report of a case of wound of the Carotid Artery, its ligation, and result, thinking it may be of some interest to your readers.

On the evening of the 14th of August last, I was stopped by a sentinel near Corinth, Miss., and informed that my brother was dying at the hospital of the 18th Mo. Light Artillery. I hastened to the place, and found my brother, Dr. P. J. Wardner, instead of dying himself, trying to prevent the life of another man from gushing out, and anxiously waiting for assistance.

A private, Adolph Bion, of Capt. Sheldon's Battery, was lying upon a cot in the open air: his face pallid, and his lips and tongue bloodless. A flat compress had been placed over the region of the right carotid, and a roller applied *around* the neck, by a surgeon, unknown to me, at the time the patient received his injury. There was still profuse hæmorrhage: his bed was saturated with blood, and he had lost very much before reaching his camp. His pulse was scarcely perceptible. My

brother, who had been with him a short time, was partially suppressing the blood, while waiting for aid.

I immediately cut away the bandage, and found the wound largely distended by clots of blood that had been retained by the compress. A part of the clot was removed, and pressure made with the finger below the wound, for the time with entire success. The pulse at times was not perceptible. At the end of an hour he had somewhat revived. I then placed a small-sized hard roller over the artery, and laid one end of a stick of wood upon it, for pressure; and leaving two men to watch him, I left him, after giving direction to be notified if he should be still alive in the morning.

Accordingly, I was informed that no bleeding had occurred, and that my patient was much better; but in half an hour afterwards, a messenger came at full speed, with the news that the man was bleeding "*like a stuck hog*."

I saw him in all haste; he had made an effort to move his head and had displaced the pressure. Syncope had occurred, and the flow mostly stopped.

The wound was made by the bottom of a brandy bottle in a row.

Being prepared for the operation, I at once enlarged the wound, and emptied it of clots, with which it was largely distended. The gush of blood at this moment was truly frightful. The wound was near the division of the common carotid.

Syncope again occurred; and with the able assistance of Assist. Surgeons E. L. Feehon, 1st Mo. Light Artillery, and A. B. Brown, 22d Ohio Infantry, I seized upon the moment to make the necessary dissection. The artery was raised out of its sheath with the common ligature needle and tied at the crossing of the *omo-hyoid*. He revived to be conscious, but no hope was entertained of his recovery.

The ligature was not applied above the wound for the following reasons:—

1st. It would have required careful dissection in the carotid space, which the immediate safety of the patient positively forbade.

2d. In case of recovery, it was considered probable that adhesive inflammation and occlusion would take place before the circulation would gain sufficient force to produce hæmorrhage from the opposite side.

3d. That the patient might have time to gain sufficient strength to endure the operation, should it become necessary.

He was conveyed upon a stretcher to a tent near Division Head-Quarters, where I had the opportunity of seeing him daily. The first week after the operation there was a low grade of irritative fever, with a strong tendency to typhoid. But upon the free use of tonics, wine, and nourishing diet, he soon began to mend. The ligature came away on the *eleventh* day.

At the end of five weeks, he was able to stand up, and walk a little with help. On the sixth week, it became necessary to move him to the General Hospital at Corinth, on account of the movement upon Iuca. He was taken in a lumber wagon, and jolted across half a mile of corduroy road in a sitting posture. This produced a good deal of arterial excitement. The night following he had an attack of hæmorrhage from the wound, and a recurrence of the same for four succeeding nights. I learned from the attendants, that arterial excitement, a flushed face, and distended bloodvessels preceded the attack.

On returning from the battle of Iuca, I called Dr. J. G. T. Halston, Medical Director, in consultation. It was determined to trust the case to the use of styptics, low diet, and *verat. viride*. A tent was introduced deep into the opening, and saturated with *liquor ferri per sulphatis*. This was allowed to remain till it was discharged by suppuration.

This treatment proved successful. The hæmorrhage did not return. The man gradually recovered, and the wound entirely healed.

On the last of October, I saw him walking about the streets of Corinth, "*all right*," except that he had not recovered his usual strength. He was awaiting his discharge from the service, and longing to be on his way to his native Switzerland.

To me this case is a very interesting one, and the result equally as satisfactory.

Query.—Was it justifiable to omit the ligature above the wound?

Very respectfully, your obedient servant,
H. WARDNER.

ARTICLE XXXVI.

CASES REPORTED FOR THE MEDICAL EXAMINER.

By O. B. ORMSBY, Assistant-Surgeon, 18th Ill.

No. I. B., a private of the 18th Regt. Ill. Vols., aged 24 years, black hair, dark complexion, very robust, was wounded at Fort Donelson by a musket ball, which entered the anterior aspect of the left thigh, and passed directly backwards, fracturing the femur in the middle-third.

Loose fragments were removed, and cold dressings applied during three days, when he was brought in to Dover. Here, Dr. DAVIS, his surgeon, constructed a simple inclined plane, consisting of two straight splints of the length of the injured limb, fastened together at the foot, and having canvas tacked across the under side to act as a bed for its reception. Light bandages were thrown around the limb. Placed in this contrivance; and the patient who had been much exposed to rigorous weather, was immediately put upon generous diet, and stimulants. As there had been considerable comminution of the broken bone, immediate union was not anticipated, but the limb was maintained at rest in a horizontal position without extension, and treated by application of cold. Suppuration was established within a few days, and some pieces of bone were discharged. On the tenth day after the receipt of the injury, he was sent by steamer to St. Louis, where, under the same general plan of treatment, (that is the "let alone plan,") he continued to improve, until sufficient union had taken place to admit of his walking on crutches, when he was sent home. He is now able to walk with a cane.

No. II. W., a private of the 18th Regt. Ill. Vols. Light hair,

light complexion, and blue eyes, American, aged 25 years, robust and healthy, was wounded in the battle of Fort Donelson by a minie ball, which passed obliquely through the left thigh, breaking the bone at the junction of its upper and middle thirds. Examination revealed great comminution, and a number of fragments were removed from the wound.

Simple dressings were applied until the third day, when the limb was placed upon the straight inclined plane without extension, and dressed by the application of a light bandage around both splint and limb. The foot was raised two or three inches, so that the limb just cleared the bed, and in that position left at rest. The strength of the patient was supported, suppuration was kindly established, and on the tenth day he was transferred to St. Louis, where he remained under the same general plan of treatment, until able to travel; when he was sent home. His limb is considerably shortened, but still, more useful than any substitute with which I am acquainted

No. III. C. a private of the 18th Ill. Vols., aged 45 years, robust in appearance, but has suffered much exposure when young, was wounded at the battle of Fort Donelson by a musket ball, which passed obliquely through the left thigh, fracturing it near its middle. So great was the shock, and permanent depression following, that an operation was not deemed advisable. Stimulants, and generous diet, were freely administered; but he soon sunk into a muttering delirium: to relieve which, all efforts proved unavailing. He remained in this condition until the tenth day, when he died, no operation for his relief having been attempted. It was concluded by all who examined him, that an operation would be a gratuitous cruelty.

No. IV. G., a private of the 18th Regt. Ill. Vols., American, aged 19 years, dark complexion, medium height and size, quite active and robust, was wounded in the battle of Fort Donelson by a musket shot, which passed through the right thigh, breaking the femur at the junction of its middle and upper thirds. When brought in, he manifested considerable depression, but rallied under the use of stimulants. The bone was so badly shattered as to induce the belief that recovery without an oper-

ation could not be hoped for; and as it appeared that in consideration of his age and general good health, recovery after operation might be at least possible; amputation was decided upon. The operation, (circular), was quickly and neatly performed by his surgeon, and for a time he seemed to bid fair for recovery. Upon the second day, however, the wound assumed a lived hue, the tongue became dry, the extremities cold, and the pulse rose to 220 in the minute. Brandy, carb. ammonia, and other stimulants, were freely administered, but he became delirious, and upon the fourth day died. In the case (No. III.) preceding this, an operation would in all probability have been followed by a very similar result.

Reflecting on the cases above narrated, and others of the same character, which have come within the scope of my observation, I am led to conclude that many limbs are amputated, which might with as little, and, perhaps, even less risk to the patient's life, be saved. The difference in gravity between an injury, such as is commonly produced by the passage of a ball through the shaft of the femur, and that which is produced by the knife of the surgeon in amputation of the thigh, appears to me to be less considerable than many believe.

In either case, the wound may be considered, and should be treated as a very dangerous one. In the treatment of gunshot injuries of the thigh upon the conservative principle, I apprehend that in the first place care should be exercised to have the external wound sufficiently large for the free escape of pus, and foreign bodies, which may be lodged there. All foreign substances should of course be removed, but, upon this point military surgeons caution us (and I think very justly to), against the forcible abduction of fragments, which, although they may be entirely separated from the bone, are still adherent to the periosteum, as laceration is liable to ensue to the extent of serious interference with the reproduction of bone. No doubt exists in my mind that many of these splinters (particularly in cases which result favorably), become reunited firmly again to the bone. In my opinion, the application of extension to these cases is bad practice. The wound is of so grave a character,

that, under the most favorable circumstances, if the patient recover he will do well, and every source of irritation, however slight, is so much in the scale against him. In these injuries also, very frequently a considerable portion of the whole circumference of the bone is entirely broken up and removed; thus when the limb is fully extended, leaving a vacancy of perhaps an inch in the length of the bone quite vacant. If the extension is kept up, this entire space must be filled with callus, beside the envelopment of the ends of the bone. The organization of callus at such a distance from the living structure is not very readily accomplished: more time being required for its completion.

It is evident, that in order to fix the bone, and render it immovable, would, under these circumstances, require a higher degree of organization; and more complete hardening of the callus than is requisite, where the fractured surfaces are in contact, thereby consuming still more time.

By the admission of air into the cavity thus resulting, an extensive suppuration may be set up in the medullary canal, when a short time will terminate the life of your patient. Whereas, had no extension been employed, the broken ends would have been approximated by the action of the muscles; the small cavities remaining, would have been filled and protected, first, by coagula, then by lymph, or other organized matter; callus would shortly have enveloped the ends of the bone, and possibly, at last, recovery might be the result. I will only remark further, that the fractures produced by ball, very generally so nearly transverse, that little or no displacement results from muscular action; and where displacement does occur from this cause, I would employ only just so much extension as would retain the bone properly in position.

For the purpose of treating fractures, where extension is not desirable, the most simple, and for the field, the best apparatus I think to be the one used by Dr. DAVIS, as described above. One of its greatest advantages is, that materials for its construction are always at hand. A couple of pieces of board, a few nails, tacks, and a strip of canvas, or piece of tent flie, is

required; or failing these, the drawer leg of your patient may be cut off, a small stick or withe bended and introduced through it, with the bow at the foot: the limb raised in it, and then swung by a cord, or raised by some other means, and left at rest. I have seen a contrivance of this kind, answer an admirable purpose, and in the absence of better appliances it is certainly worthy of trial.

ARTICLE XXXVII.

THE MEDICINAL USES OF ERGOT, OTHER THAN
AS A PARTURIFACIENT.

By M. O. HEYDOCK, M.D.

Read before the Chicago Medical Society.

The cure of a disease is brought about by the removal of its proximate cause; and this is effected either by the *vis medicatrix naturæ*, or conjointly with the assistance of art. The careful observer learns, as far as is possible, in what way nature accomplishes the result unaided, and discovers that under certain circumstances, it is through a greater activity of the skin, the intestinal canal, or the renal organs. Having noted that nature spontaneously removes many derangements of the animal economy, his next step is to learn what drugs will accomplish like results when nature fails. The accumulated experience of medical men for ages has furnished us with many medicines, mineral and vegetable, which we may rely upon as positive agents. Croton oil is a drastic cathartic, given internally, and an irritant applied externally; the Spanish fly blisters the surface; and sulphate of zinc or ipecacuanha causes emesis.

The physician, should he so elect, may stop at this point, satisfied with the accomplished fact, not caring how the results are brought about, or in other words, the *modus operandi* of this drug, he goes on, skilful perhaps in diagnosis, and so far as the evacuant treatment is of benefit, using his remedies with a fair degree of success. But in that class of cases for instance, where

the question arises whether the extreme vessels are dilated or contracted, and whether a drug has the power to cause or remove either of these morbid conditions, he finds himself at fault.

I use this illustration because the subject I propose discussing in this evening's paper has, with several others, been ably presented to the profession by BROWN SEQUARD, in a series of articles upon some forms of paralysis. I know that there are those who think that ergot was designed by Providence for parturient women alone, and consequently that we should be satisfied that in so doing it has accomplished its mission; it is an absurdity, say they, to bring it forward as a remedy in paralysis; we have in strychnine the only agent we want, and if this will not cure our patient, nothing will.

I cannot subscribe to these opinions, believing, as I do, that there is no department of our professional study which to-day repays labor and research like the unfolding of the hidden treasures of our *materia medica*.

Each year is fruitful of some discovery, which explains and makes clear to the student the reason *why* certain results are brought about with a good degree of certainty by certain remedies; some great practical truth is developed which—engrafted upon sound views of physiology and pathology—enables him to apply a remedy in cases where accident and good fortune might never have inclined him.

I shall relate to you opinions gleaned from various authors and writers, in reference to the use of ergot, aside from its action as a parturifacient, many of which go to support SEQUARD'S theory, which you are aware is that many cases of paralysis are attended with, or caused by, hyperæmia, or congestion of the vessels of the spinal cord, while in others the opposite condition exists; and that the remedy indicated in one class of cases fails in or aggravates the other, and his acknowledged success in the treatment of the grave lesions entitles his opinion to our confidence and respect. He claims that ergot, belladonna, and mercury cause contraction of the extreme vessels of the cord; while strychnine and brucia cause congestion and fulness of those vessels; and he uses them as he thinks this or that condition exists.

I shall not seek to support his theory, but by citing extracts in reference to the different uses to which the ergot has been put, leave each to decide whether he can reconcile the action with the hypothesis.

He believes that belladonna acts with greater energy upon those of the brain, while ergot is preferable where we wish to reach those of the spinal cord. In large doses, this drug is said to produce a sense of pain and weight in the head, giddiness, dilatation of the pupils, delirium, and stupor; and, according to WOOD & BACHE, a reduction in the frequency of the pulse.

Its long continued use has, we know, caused terrible and devastating epidemics in France, and different parts of the continent of Europe; death occurring, in many instances, which could be traced directly to the use of bread contaminated with the presence of this degenerate grain.

Prominent among the symptoms, to which its use gave rise, were dry gangrene, great disturbance of the nervous system, attended with convulsion, typhus fever, and kindred disorders.

WOOD asks if it may not have the power of producing contraction of the capillaries in general, or of interfering in some other way with the circulation of the blood in these vessels, as by the exertion of a direct sedative or paralyzing influence on them, as in this way we may explain the dry gangrene, resulting from its use as well as its influence in restraining hemorrhage.

Dr. C. L. MITCHELL, of Kings County, New York, read a paper upon its use in spermatorrhœa, congestion, and irritation of the genital organs of the male.

He says that it was first used in diarrhœa in 1840, and about one year afterwards, in various hemorrhages. He now used it in dysmenorrhœa, which he supposed to arise from congestion of the uterus and its appendages, and with success.

Its use was attended with gratifying results in cases of spermatorrhœa.

The second case treated of this nature, was that of a physician, who was a confirmed opium eater, and a great sufferer

from seminal emissions, the combined influence of which had reduced him to a condition not much removed from dementia; great benefit was derived from its exhibition within seven days.

In a case of great irritation about the neck of the bladder, ergot and camphor were given; and though it was of several days' duration, and a severe one, relief followed the first dose.

A writer in the *Medical Gazette*, of 1848, says that he finds that ergot, taken as a snuff, will remove the excessive dilatation of the pupil, arising from belladonna, and thinks that it may be successful in dilated pupil from other causes.

Dr. ROUSSELL, of St. Bartholemew's Hospital, speaks highly of its use in pulmonary hemorrhage, after various remedies had been tried in vain, the first dose controlling it.

Dr. PAGAN, in the *Medical Gazette*, of 1842, records three cases of paraplegia treated by it successfully; one of which was the result of saturnine poisoning.

Mr. WRIGHT, in an article upon the oil of ergot, speaks of its use in capillary hemorrhage, bleeding from leech bites, the extraction of a tooth, and diarrhoea.

Numberless cases are reported in *Braithwaite*, and other journals, of its use in retention of urine. One case where it had been complete, it yielded after a few days' use of ergot, in doses ranging from 10 grains to half a drachm. One girl, who had long suffered from this disorder, but who was under treatment for amenorrhoea, was entirely relieved by six doses.

Dr. MITCHELL, to whose paper I previously referred, reports a case where the catheter had been required for a space of three months, as being entirely cured by this treatment. Its value in these cases cannot be denied.

Dr. BARKER, of New York, says that he seldom has occasion to use the catheter in the retention following labor; and since I noticed his suggestion, I resort to its early use, and in many cases have derived much benefit from its administration.

Dr. ALLIER, in the *London Lancet*, of 1848, laid down the following conclusions:—

I. Ergot restores to the bladder its contractility, impaired by immoderate distension of its coats, and has acted in this manner when all other means have failed.

II. Paralysis of the bladder, arising from cerebral hemorrhage, has promptly given way under its use; but it has no effect in paralysis of the limbs, resulting from apoplexy.

III. It shortens the duration of vesical paralysis, failing once in fourteen times, which is about the proportion of approved remedies.

IV. Its effects are rather evanescent, and it should, therefore, be frequently repeated; the dose may be 60 or 70 grs. a-day, and it should be gradually reduced after apparent recovery.

V. He sums up by saying that we have in the systematic use of ergot a remedy capable of shortening vesical paralysis, which after a longer or shorter time, *may* yield to other means; but which is often looked upon as incurable, and often producing that sad and disgusting infirmity—incontinence of urine.

I have now presented such facts and observations as I have found recorded; and I think that very many of them support the theory advanced. If, in the crucible of experience, this position is sustained, we have a remedy of great value, and one of which the profession will not be slow to avail itself. If, on the other hand, it prove like many which have proceeded it—beautiful in theory but inert and powerless for good in practice—we shall, at any rate, have the consolation of feeling that we have not labored in vain, for a negative result in one direction is not necessarily barren of influence upon events and discoveries which follow after.

ARTICLE XXXVIII,

ON THE TREATMENT OF CANCEROUS DISEASES.

By E. MARGUERAT, M.D., of Chicago.

Read before the Chicago Medical Society, 1862.

I am aware, gentlemen, that this is rather an unpromising subject for an essay now a days. The incurability of cancers has been so often proclaimed, *ex cathedra*, that late writers have become very dogmatic on the subject. Still, for my part, I like

the hopeful spirit of old Dr. MOTT, who, so often used to say in his lectures, that he had no doubt but some day a specific should be found for the cure of consumption and cancers. It has been frequently reproached to some of our late clinical writers, especially in France, that they display all their talent and energy for the improvement of pathology and diagnosis, but scarcely give a passing attention to the treatment. This is, perhaps, too much the case to-day with the profession at large, on the subject of cancers. As a general rule, when a cancerous patient applies to a medical man, the knife is the only hope offered to him, and if he is too timid, or too incredulous to submit to an operation, his only resource is in the advertising charlatan, and it is my candid opinion that he is not always successful there. The *ipse dixit*, ought to have less power in the practice of medicine than anywhere else; prejudice has often barred the way to progress. Because we have no medicine that has proved generally successful in the treatment of cancers, authors have denied in toto that any case of cancer had ever been cured by medicine.

It appears, unfortunately, that we have no rule by which we can diagnose with certainty a cancerous growth in its first stage at least. Even the microscope fails to give us a certain criticism. The so called cancer-cell on which so much importance has been placed, has lost a part of its claims. VIRCHOW, in his late work on cellular-pathology, comes to the conclusion that cancerous formations have no tissue-element that belong to them exclusive. Hence the great difficulty that has always been experienced in defending their claims, by those who believed to have cured cases of cancer. It has always been an easy matter to accuse them of error in diagnosis. The case was cured, ergo, it was not a case of cancer. There is, however, one class of so called semi-malignant growths, for which a little more charity has been shown. A great deal has been written of late years on epithelial cancers, epitheliomas, or canceroids; a separate class has been made of them, not however on a very sure foundation. Many prove to be as truly malignant in their nature as carcinoma; and to quote VIRCHOW again: "It is impossible to find a well defined limit between the different

formations of this group; they might all be included under the collective name of cancers, but for the clinical experience which shows that cancers generalize themselves usually, while canceroides do so seldom. The malignancy of new formations, depends much less on their tissue elements, than on the following two considerations: their more or less degree of organization, and their state of fluidity.

However this may be, it must be admitted that cancers are as much a constitutional as a local affection; hence, the constitutional treatment ought to have, at least, as much importance as the operative treatment. PAGET, in one of his papers, gives the statistics of a large number of cases, from which he concludes that in cases of scirrhus of the breast, patients die on an average thirteen months sooner, on whom an operation has been performed. If such should be the case, it is well worth the while to see what has been done; and what can be done, by a medical treatment. Dr. COOKE, in his essay, read before the London Medical Society in 1858, says, that the constitutional treatment of cancers is the only one in which he has any confidence. He places his chief reliance on a proper regulation of the diet, and habits of the patient, together with a tonic medication.

He claims to have by a persevering attention to this system, completely eradicated some well marked cases of cancerous diathesis.

Dr. TEESON, surgeon of the Middlesex Hospital, reports a case of mammary scirrhus entirely cured by the use of chlorid of zinc, both internally and externally; and another case much benefited by the same treatment.

Dr. MONTGOMERY, in his essay on cancer of the womb, terminates by saying that he knows such cases to be curable without operation, if taken early. Antiphlogistic treatment at the beginning, followed by iodine, iron, arsenic, with local application of nitrate of silver, when necessary, form his treatment.

Dr. WALSHE relates a case of incipient tumor of the breast, that completely and permanently disappeared under compressions and the internal administration of iodine.

Dr. FANCHOU, in 1849, presented to the Medical Society of Paris, two cases that were admitted by them as cancerous. After a three month's treatment, the first case, a cancer of the chin was returned cured; the second, a mammary scirrhus in its second stage, was very materially benefited. His remedies were iodine and arsenic, internally and externally, with the necessary attention to diet, etc.

LANDLOFI, a surgeon of the metropolitan army, submitted in 1855, to a commission of physicians both in France and Germany, the result of his treatment of several cases, acknowledged by all, as cases of a malignant nature. Several of them were in succession returned, either cured, or materially improved, by the persistent use of chlorid of bromine. Among the cases are two cancers of the breast.

It would be tedious to repeat at length all the authorities on the subject. STORK, HAVELAND, STANLEY, SPENCER, WELLS, SIMON, DEVAY, MANCE, all men of reputation and integrity, report cases successfully treated by them. One case related by Dr. A. T. THOMPSON, has a special interest; it is that of a woman, 46 years of age, with a double mammary tumor, offering all the characters of scirrhus. After a persevering use of iodide of arsenic and conium, for more than eleven months, the tumor had entirely disappeared, and the woman was in good health.

Many other authorities might be quoted, but these are sufficient for my purpose. They satisfy me, that a good deal can be done by medication in the cancerous diathesis; and I cannot subscribe to the sweeping assertion of ERICHSEN and others, "that all constitutional curative treatment of cancers is altogether useless. To be sure, in the present state of our knowledge, we have no remedies possessed of a specific virtue in the treatment of cancers; but we have in the bichloride of mercury, iodine, chlorine, bromine, arsenic, and their combinations, a valuable store that has power and will still prove useful. And, I think, if we had had more men of the perseverance of Dr. THOMPSON, we should be able to produce more cases of cures.

It has been my privilege to spend some time with Dr. MAYER, formerly a surgeon in the Hospital of Lausanne. During his

short stay in a country district in the State of N. Y., he was called upon to treat several cases of cancerous diseases, and had at that time a large reputation for skill and success. Although an advocate of the operation in all cases that permitted it, he relied in many cases on a combination of external applications and constitutional treatment. He employed in turns iodine, arsenic, the bichloride, &c., in varying combinations with tonics; caustic ointments of a slow action, nitrate of silver, potassa, &c. I have no notes of any of his cases, but I can testify to many cases of malignant ulcers entirely cured, and several cases of cancer of the breast improved by him.

My own experience has furnished me with a few cases that have been of great interest to me. I shall only briefly report a few. The first was a case of cancer of the lower lip, that I followed under Dr. MAYAR's treatment. The cancer had commenced as a wart, on the side of the lower lip, and had gradually gone to ulceration. The patient was a man about 50 years of age. He had been treated by several physicians; had apparently taken a good deal of arsenic, without benefit, when he applied to Dr. MAYAR. As he was not willing to submit to an operation, he was put on the use of iodine internally, with occasional cauterization of the ulcer, anodyne plasters, and bichloride of mercury. Dr. MAYAR, at that time, returned to Europe, and left the patient in a rapidly improving condition. At the end of three months' treatment, the ulcer was cicatrized and the patient well.

The second case is that of Mr. C. Jackson, Lansing, N.Y. Several years before I saw him, he had been troubled with a chronic form of ulceration of the cheeks, nose, and eyelids. He had been under the care of several cancer curers. When he applied to me, two years ago, he had half a dozen ulcers, of the size of a ten cent piece, on his cheek; a hard indolent swelling of the upper lip, and the right ala nasi was perforated by an ulcer, through which I could pass the end of my finger. The skin around the ulcers was red and hard. He was a man 70 years old, of temperate habits; had never had any syphilitic disease. I first subdued the inflammation by cooling emolient

applications and rest, and after a while put him on the use of Donovan's solution. I then applied chloride of zinc to the ulcer in the nose, and nitrate of silver repeatedly on the ulcers of the cheeks. However, I obtained no benefit from external application for the first six weeks or two months; the ulcers kept growing, and that in the nose had nearly doubled in size. I kept increasing the dose of Donovan's solution until he complained of weakness and swelling in his limbs. I then gradually diminished the dose, and commenced again the application of chloride of zinc. I was very gratified to find after one application the ulcer in the nose take a rapid turn, assume a healthy gradulating appearance, and finally, entirely close, after three or four weeks; leaving only a puckered cicatrix. I kept him on infusion of sarsaparilla, *ad libitum*. The skin all over the face assumed a smooth and healthy aspect; the swelling of the lips disappeared; no return of the disease had occurred when I left a year ago.

I do not claim this case to be positively of a cancerous nature; but call it lupus, or canceroides, or anything else. It certainly was a case of a very obstinate character; and on it I have two remarks to make here: 1st, that no benefit in the treatment followed the use of caustics, until the constitutional treatment had been carried very far; and, 2d, that during the course of the treatment I happened to prescribe a few pills containing half a grain of calomel each. When he returned to me after having used them, the ulceration had spread at a rate, at least, twice as rapid as it had at any other time before. I could discover no other cause for it than the calomel; this again proves the importance of the constitutional treatment.

Five years ago, in Ithaca, N. Y., I saw in connection with Dr. CORYELL, a distinguished practitioner in the place, two cases of mammary cancers in their second stage, and very similar in their symptoms and history. Both presented a large ulcerated surface; the glands in the axilla and neck were in both enlarged and indurated. The cancerous cachexia was not yet very apparent. They were evidently not cases for operation. We undertook to do what we could, in the way of palliative

treatment. Bichloride of mercury and arsenic were prescribed, in combination with anodynes; careful partial cauterization of the ulcers, followed by soothing applications, and tincture of iodine on the enlarged glands, were alternately used. After a few weeks' treatment, one of the patients tired of the process, yielded to the persuasions of some friends, and went to undergo an operation in New York City. After a few weeks' absence, she came back apparently perfectly cured, and greatly elated. Two weeks afterwards she died from some pulmonary affection, I believe. In the other patient, a perseverance in the treatment brought gradually a diminution in the size of the gland; the ulceration remained nearly stationary; her general health kept unimpaired, and she was still alive when last I heard of her, a year afterwards.

I have no doubt, gentlemen, that most of you might draw from your experience cases similar to these, and, perhaps, of a still greater interest. Whatever conclusion you may have come to, I think I am justified in saying that all curative constitutional treatment is not altogether useless; and, whenever I meet with a case favorable for it, I shall try what a persevering constitutional treatment of cancer can do.

According to Dr. Fanchou's statistics, the number of cancers is on the increase. And, still in 1840, the number of deaths by cancer, in the city of Paris alone was nearly 800. It then comes within the province of every physician, to give a serious attention to the treatment of an affection that must often come under his care in the course of a long practice. It is only the general experience of the profession that can satisfactorily solve the question of the curability of cancers. It is an interesting fact connected with the history of cancers, that the first case on record, 900 years B.C., is reported by HERODOTUS, to have been cured without operation.

Army Correspondence.

ARMY IN THE FIELD, SOUTH OF TALLAHATCHIE RIVER,
MISSISSIPPI, Dec. 5, 1862.

MESSRS. EDITORS:—Although there are no great combats to record at present, nevertheless, it may be of some interest to your readers to hear from this part of the army.

During the spring and summer, the most common diseases among us were diarrhoea and dysenteries, often running to the chronic form. As summer advanced, bowel diseases became a little less frequent, and periodical fevers took their place. In September, intermittents and remittents were considerably prevalent. A number of fatal cases of congestive fever occurred in the infantry, outside of Memphis, but scarcely any in the garrison proper. A few cases of remittent fever ran rapidly to a fatal termination; but scarcely any true typhoid fever proper, as seen in Chicago, occurred. September proved the sickliest month in the year, yet the number under treatment was only nine per cent of the whole force; which is one per cent less than Lord Wellington states as the minimum amount of sickness obtainable under the best circumstances. It was observable also, that the artillery suffered much less than the infantry; of about 175 cases of acute dysentery, occurring in the artillery during seven months, not one proved fatal, and sickness of other kinds was milder, and less frequent by far among them, than among infantry. I attribute the difference to the fact, that the infantry soldier on the march, is put to excessive exertion, both in carrying his knapsack, arms, and ammunition, and also by the very act of walking under a boiling southern sun. This aggravates all bowel complaints. When not on the march, he relapses into a state of too great inaction, having often for weeks very little vigorous exercise to perform; thus, alternately between the extremes of exhausting labor and enervating quietness, he suffers by the sudden changes to which he is exposed. The artillery soldier, on the contrary, has a pretty uniform life of moderate steady labor: the constant care of his horses, harness, side arms, etc. etc., secures steady exercise in camp, and when put upon

he march, he rides either on horse or caisson, so that the transfer to the field makes very little increase of his hardships, or change in his mode of life. This state of things, very much favors a uniform good health.

In the cavalry I find that surgical accidents are very common, and especially for hernia. The act of riding brings the abdominal muscles into constant use in preserving the position of the body in the saddle, hence, the abdominal viscera being constantly pressed upon, at length bulge through the inguinal rings. Some also are kicked by horses; bruised on the pommel of the saddle, or fracture limbs by being thrown.

Our advance thus far into Mississippi has resulted in very little fighting. The front skirmished with slight loss; and there is little of surgical interest to relate. At present the diseases are few and sparse: consisting mainly of acute bronchitis, mild pneumonias, and slight rheumatics. We live on the country, finding plenty of poultry, cattle, sweet potatoes, corn, and forage, so that the diet both of men and horses is superb; and, of course, scurvy is out of the question, and other diseases mild. The climate is mild, generally requiring no overcoats in the day time, but giving us frequently a sharp frost at night. Our sick were left behind when we left Memphis, so that surgeon's duties are now light. The flora of this region presents some striking changes as we advance. The mistletoe is abundant, of course, and numerous other evergreens present themselves as we advance. Among them is the cane, which does not here get its full growth, but appears larger, as we advance. There are several woody vines which appear to retain their foliage all winter, and a number of trees of the latter one or two are, I believe, species of the holly; the trunk and leaf closely resemble the beech, but the foliage is evergreen, and present at the present time a vividness of green, not one whit less than that of the fullest glory of midsummer.

At present, this part of the army has halted south of the Tallahatchie, while the other is pursuing the flying enemy beyond Grenada. Apparently, we must do some weary marching before we can bring them again to battle. Yours truly.

E. ANDREWS.

Selections.

EXPERIMENTAL RESEARCHES INTO A NEW EXCRETORY FUNCTION OF THE LIVER, &c.

Bx AUSTIN FLINT, JR., M.D., Professor of Physiology and Microscopy
in the Bellevue Medical College, New York; &c.

(Continued from page 630.)

Functions of the cholesterine.—By experiments which I have performed upon the lower animals, and by certain facts which have been developed by observations on the human blood in health and disease, I conceive that I have been enabled to solve the problem of the function of cholesterine.

Cholesterine is an excrementitious product, formed in great part by the destructive assimilation of the brain and nerves, separated from the blood by the liver, poured into the upper part of the small intestine with the bile, transformed in its passage down the alimentary canal into stercorine (the seroline of Boudet, a substance differing very little from cholesterine), and, as stercorine, discharged by the rectum.

The quotation with which I prefaced this paper expresses the actual state of the science with regard to cholesterine. Still, though our actual knowledge of its function has been so slight, a few writers on chemical physiology and on physiology, taking the limited data on this subject, make reference to it as an effete substance. With regard to its relation to the brain, some think that it is formed in the brain and taken up by the blood, while others think that it is formed in the blood and deposited in the brain. All the views with regard to its effete properties are, of course, based on the supposition that it is discharged in the feces. Effete matters are discharged from the body, and this would find its exit by the anus, since it has never been detected in the urine. These conjectures have attracted little attention in the scientific world; and these views being based on the supposition that this substance is formed in the fecal matters, fall to the ground from the fact that no one as yet detected it in the feces. The fact that cholesterine is so generally considered an ingredient of the feces may be thus explained. It is poured into the alimentary canal with the bile; no one has shown what becomes of it, the chemistry of the feces being little understood, and therefore it has been assumed that it is found in the feces. That the facts which we have with regard to cholesterine render

its effete properties possible, and, perhaps, probable, is certainly true; but these facts are merely sufficient to enable the scientific investigator to address an intelligent inquiry to nature on this subject; they do not resolve the question. In the experiments which form the basis of this article, the inquiry was made and the answer obtained; some others have, without much reflection, apparently, made simple statements which approximate in some degree to the facts. The only way these assertions could be sustained is by the labor which I have expended in eliciting from nature a reply to my interrogatories.

The works which I have had an opportunity of consulting, where any decided opinion relative to the function of cholesterine has been expressed, are those of Carpenter, Lehmann, Mailhe, and Dalton.*

Carpenter, in the fifth American edition of his *Human Physiology*, 1853, has the following with regard to the function of cholesterine.

"It is also stated to be a constituent of the nervous tissue, having been extracted from the brain by Couerbe, and other experimenters; but it may be doubted whether this is not rather a product of the disintegration of nerve-substance, which is destined to be taken back into the blood for elimination by the excretory apparatus, like the kreatine which may be extracted from the juice of flesh, or the urea which is obtainable from the vitreous humor of the eye, both being undoubtedly excrementitious matters. For cholesterine is a characteristic component of the biliary excretion, and is closely related to its peculiar acids; so that it can scarcely be looked upon in any other light than as an excrementitious product, the highest function of which is to assist in the support of the calorifying process. It is frequently separated from the blood as a morbid product; thus it is often present in considerable quantity in dropsical fluids, and particularly in the contents of cysts; and it may be deposited in the solid form in degenerated structures, tubercular concretions, &c."†

In Lehmann, we find the following on this subject:—

"Judging from the mode of its occurrence, we must regard it as a product of decomposition; but from what substances and by what process it is formed, it is impossible even to guess. Notwithstanding the similarity which many of its physical properties present to those of the fats, we can hardly suppose that it takes its origin from them, since the fats, for the most part, become oxidized in the animal body, whereas in order to form cholesterine, they must undergo a process of deoxidation."‡

I translate the following from the excellent work of Mailhe, on *Chemistry applied to Physiology and Therapeutics*, Paris, 1856, the paragraph entitled "Source of Cholesterine in the Animal Economy."

* These authors are quoted in the order in which their publications appeared.

† Carpenter's *Principles of Human Physiology*, page 74. Philadelphia, 1853.

‡ *Physiological Chemistry*, by Professor C. G. Lehmann, vol. i. 248. Philadelphia, 1855.

"We have just examined in what manner the fatty bodies penetrate into the blood. Some eminent *savans* have held that the fatty matters from the exterior are the only ones which exist in the economy, and that it is incapable of producing these in itself. Now it is an opposite opinion which tends to predominate, and the majority of physiologists think that certain fatty bodies take origin in the very substance of our organism. This last mode of origin seems at least incontestible for the cholesterine, which has not yet been found in the vegetable kingdom.

"But what are the chemico-physiological reactions which preside over the development of this particular fatty substance?

"There are for us two modes for comprehending the formation of the cholesterine at the expense of the elements of the blood. Cholesterine may come from the fatty matters; it would be, in this case, like the final result or last stage of chemical modifications which the fatty matters undergo in the animal economy.

"This manner of viewing it is slightly probable; for, in order that it should be true, it would be necessary that the fatty bodies, in oxidizing, should give rise to a compound richer than they in carbon. We know, indeed, that cholesterine is, of all fatty bodies, the one which contains the most carbon.

"We think that we should reject that opinion and stop at the following:

"The production of cholesterine may be attributed to a transformation of the albuminoid materials, a transformation analogous to that which has been pointed out by M. Blondeau de Carrolles in cheese, and which that chemist has designated under the name of adipose fermentation. The large proportion of carbon which the cholesterine contains, and which approximates it to albuminous matters, would come to the support of that point of view. The retardation of the circulation, and the deficiency of oxidation which is the consequence of it, explains also why the cholesterine is in much greater proportion in the closed cavities than in the blood itself.

"Whichever it may be of these two opinions, it is incontestible for us that, if the cholesterine be not burned with the other matters proper to respiratory alimentation, it is solely on account of its chemical inertia; cholesterine, indeed, is to fatty matters what mannite is to saccharine substances—what urea is to albuminoid matters; that is to say, that it constitutes a kind of *caput mortuum*, of which the organism has only to free itself. It is certain, also, for us, that if the cholesterine is not found in all the excrementitious liquids, where most of the other products existing in the blood are found, it is solely on account of its insolubility.

"The preceding remarks explain perfectly, to our eyes at least, why the presence of cholesterine has never been established in the urine of man, either in the form of crystals, or 'calculi,' while this substance is found in the bile, where it very often forms calculi of considerable size. Cholesterine, indeed, is insoluble in acid liquids, such as the urine; while it is soluble in soapy liquids, such as the bile. Such is solely the reason why the cholesterine is excreted by the biliary passages."*

Finally in Dalton's *Treatise on Human Physiology*, we find the following paragraph in which the subject of cholesterine is considered:—

"CHOLESTERINE ($C_{26}H_{42}O$).—This is a crystallizable substance which resembles the fats in many respects, since it is destitute of nitrogen, readily inflammable, soluble in alcohol and ether, and entirely insoluble in water. It is not saponifiable, however, by contact with the alkalies, and is distinguished

* *Chimie appliquee a la Physiologie et a la Therapeutique*. Par M. le Docteur Mialhe. Page 191. Paris, 1856.

on this account from the ordinary fatty substances. It occurs, in a crystalline form, mixed with coloring matter, as an abundant ingredient in most biliary calculi, and is found also in different regions of the body, forming a part of various morbid deposits. We have met with it in the fluid of hydrocele, and in the interior of many encysted tumors. The crystals of cholesterine have the form of very thin, colorless transparent, rhomboidal plates, portions of which are often cut out by lines of cleavage parallel to the sides of the crystal. They frequently occur deposited in layers, in which the outlines of the sub-jacent crystals show very distinctly through the substance of those which are placed above. Cholesterine is not formed in the liver, but originates in the substance of the brain and nervous tissue, from which it may be extracted in large quantity by the action of alcohol. From these tissues it is absorbed by the blood, then conveyed to the liver, and discharged with the bile."*

The above extracts embrace all that I have been able to find bearing on the question of the function of cholesterine. The extracts from Mialhe and Dalton contain all that is said by them on this subject. Those from Carpenter and Lehmann contain only what bears on the function of this substance, the chemical details being omitted. Of the authors cited, Mialhe is the most extended on the subject, and is almost the only one who adduces any arguments to support his views; but his opinions are biased by the purely chemical view which he takes of the subject, and are involved with the ideas with reference to plastic and calorific food, now rejected by many eminent physiologists, and which, I conceive, will be so little supported by future advances in science, that they will soon be universally discarded, in the exclusive sense in which they are received by him. Putting these hypotheses aside, we examine the actual state of our science, with regard to cholesterine, and we find that the function, up to this time, has not been established. We will now proceed to the facts which tend to support the statement I have made on this point.

Cholesterine exists in the blood, from which it may be extracted in a state of purity, and estimated by the process which I have already indicated. Becquerel and Rodier have made analyses of the healthy human blood for this substance with the following results:—

Venous blood of the male.	0.09	pts. per 1,000
" " " female,	0.09	" " "

I have made a quantitative analysis of three specimens of healthy human blood with the following results:—

* A Treatise on Human Physiology, designed for the use of students and Practitioners of Medicine. By John C. Dalton, Jr., M.D., Professor of Physiology and Microscopic Anatomy in the College of Physicians and Surgeons, New York, &c. Page 189. Philadelphia, 1861.

				Quantity of Blood.	Cholesteroline.	Proportion
				grains.	grains.	per 1,000 pts.
Venous blood from the arm; male	st.	35		312.083	0.139	0.445
Do. do. do. (colored)	st.	22		187.843	0.123	0.658
Do. do. do.	st.	24		102.680	0.077	0.751

These three analyses were all carried on at the same time, and each specimen subjected to precisely the same process. The results show a wide range within the limits of health. The difference was not due to any variation relating to the digestive process, as the specimens were all drawn at the same time, and were taken from prisoners on Blackwell's Island, who were subjected to the same diet, and ate at the same time. It will be seen by this table that I have obtained from five to eight times as much as is indicated by Becquerel and Rodier. I can only explain this by the fact that I operated on the whole blood, while they only analyzed the serum. Boudet states that it is necessary to make three to four copious bleedings, and mix the serum in order to obtain a sufficient quantity for a satisfactory analysis. I have operated on about fifty grains of blood with success, and have no doubt but that I would be able to extract the cholesteroline in a crystalline form, and estimate its quantity in fifteen and twenty grains. The purity of the extract can easily be demonstrated by a microscopic examination. I conclude, then, that a much larger quantity of cholesteroline exists normally in the blood than has been supposed, and that its variations, in different persons, within the limits of health, are considerable.

The next question which naturally arises is the origin of the cholesteroline. When we examine the situations in which it is found, we find that it exists in largest quantity in the substance of the brain and nerves. It is also found in the substance of the liver, probably in the bile which is contained in this organ, and the crystalline lens, but with these exceptions it is found only in the nervous system and blood. Two views present themselves with regard to its origin. Cholesteroline is deposited in the nervous matter from the blood, or is formed in the brain and taken up by the blood. This is a question, however, which can be settled experimentally, by analyzing the blood for cholesteroline as it goes to the brain by the carotid, and as it comes from the brain by the internal jugular. The cholesteroline being found also in the nerves, and, of course, a large quantity of nervous matter existing in the extremities, it is desirable at the same time to make an analysis of the venous blood from the general system.

With reference to this question the following experiment was made:—

Exp. 3. A medium sized dog, about six months old, fasting, was put under the influence of ether. The carotid and internal jugular were exposed on the left side, and the animal allowed to come out from the effects of the anæsthetic. Two hours after, he was again etherized, and the blood taken from the following vessels in the order in which they are named: 1, Internal jugular; 2, Carotid; 3, Vena cava; 4, Hepatic veins; 5, Hepatic artery; 6, Portal vein. In the operation of drawing the blood from the abdominal vessels, immediately after opening the abdomen a ligature was applied to the vena cava and a little blood taken, which prevented the blood from the inferior extremities from mixing with the hepatic blood. The blood was then taken from the hepatic veins, a matter of some difficulty, as it is always more or less mingled with blood returning through the thoracic vena cava, and a ligature applied to the hepatic artery and portal vein. The blood was then drawn from the hepatic artery and portal vein.* A quantity of bile was then taken from the gall-bladder, and a portion taken from the substance of the brain. These specimens were received into carefully weighed vessels and weighed; but as I failed to make a quantitative analysis, my process of extraction not having been perfected, it is unnecessary to enter into details. They were then dried and pulverized, treated with ether, evaporated, the residue extracted with hot alcohol, allowed to evaporate spontaneously, and examined with magnifying powers of 70, 270, and 400 diameters successively. The residue of the bile and brain were found to consist of nearly pure cholesterine, but in all the other specimens, excepting that from the internal jugular, the appearance of cholesterine was doubtful. They all contained, with masses of

* The operation of collecting the blood from any particular vessel is by no means so easy as might at first be supposed. The greatest care is necessary in order to obtain it unmixed. This is particularly so in the case of the hepatic vein, the unmixed blood from which it is exceedingly difficult to obtain. In drawing blood, the operation must be done as rapidly as possible to avoid the derangements of the circulation which arise from exposure of the vessels, pressure, etc. In taking blood going to and coming from a part, it must always be taken from the vein first; as ligating or compressing the artery would of course arrest the circulation. As the blood in the arterial system is not subject to the same changes in composition as the blood in the different veins, any specimen of the arterial blood will represent the blood going to a part, unless, like the liver, it receives blood from the venous system. The collection of blood I have found the most difficult part of these investigations.

ordinary fat, crystals of stercorine.* There were a few distinct plates of cholesterine in the specimen from the internal jugular. The specimens were then treated with a solution of caustic potash and set aside. In two days, part of the potash was removed with bibulous paper and portions of the precipitates taken out, placed upon slides, and examined microscopically with one-sixth and one-twelfth inch objectives successively. The watch-glasses were then set aside, carefully protected from the dust, and examined again ten days after, when they had become entirely dry. The following was the result of the examinations of the extracts of blood from the carotid, internal jugular, vena cava, and the extract of the brain. The examination of the other specimens has nothing to do with the question now under consideration, and their description is deferred.

Blood from the carotid artery.—First examination, three days after the operation, discovered a large number of small crystals of stercorine and masses of fat; but after the most careful examination, prolonged for two hours, I failed to discover any crystals of cholesterine. The appearance is represented in Fig. 2.

The second examination, eleven days after, discovered a small quantity of cholesterine mixed with the matters noted in the first examination. This appearance is represented in Fig. 3.

Substance of the brain.—All the microscopic examinations of the extract from the brain showed crystals of cholesterine in large quantity. The crystals from the brain are described by Robin as being thinner and more elongated than those found in other situations.† This peculiarity I also noticed. The appearance is represented in Fig. 4.

Blood from the internal jugular.—In the first examination of the specimen from the internal jugular, after the blood had been treated with ether, the ether allowed to evaporate, and the residue extracted with hot alcohol, well-marked plates of cholesterine were noted. At this time it could not be discovered in any of the other specimens of blood after the most careful and patient examination. After the caustic potash has been added, the

* Stercorine, or seroline, is a non-saponifiable fatty substance resembling the cholesterine in many of its chemical properties, but fusing at a much lower temperature. It was discovered in the serum of the blood by Boudet about 1833. It crystallizes in the form of needles, which will be more particularly described when we treat of the extraction of this substance from the feces. As I have found it in great abundance in the feces, and am disposed to doubt its existence as a natural constituent of the serum of the blood, I have called it *stercorine*, for reasons which will be more fully explained further on.

† *Traite de Chimie Anatomique*, Robin and Verdel, tome iii. p. 57.

cholesterine was demonstrated in large quantity, with a few crystals of stercorine. The appearance is represented in Fig. 5, which was drawn eleven days after the blood was collected. Another examination was made on the following day, which showed, in addition to the cholesterine, a considerable quantity of stercorine. (See Fig. 6.)

Blood from the vena cava.—The extract of the blood from the vena cava, examined eleven days after the blood was drawn, showed a large quantity of stercorine and a few crystals of cholesterine. The cholesterine was distinct but not very abundant. (See Fig. 7.)

These experiments, the first that I made on this subject, demonstrate the following facts: 1. That the brain contains a large quantity of cholesterine (which had, however, been previously established). 2. That the blood going to the brain contains a small quantity of cholesterine, while the blood coming from the brain contains a large quantity. 3. That the blood coming from the lower extremities and pelvic organs contains more cholesterine than the blood carried to them by the arterial system.

It was only necessary to confirm these statements by further investigation, to be enabled to deduce from them the following important conclusion: *i. e.* That cholesterine is formed in some of the tissues of the body; and judging from the fact that the nervous tissue is the only one in which it is found, and that the blood gains it in its passage through the great nervous centre, it is formed, in great part, by the nervous system. After the first experiment, which almost confirmed the supposition with which I had started, I directed my attention to the perfection of a process by which I might make an accurate quantitative analysis of the blood for cholesterine, so as to be able to state positively that it gained cholesterine in its passage through certain organs, and furthermore to determine the amount of increase. After a number of experiments, I fixed upon the process which I have minutely described in the first part of this article, and made the following experiments for the purpose of ascertaining the quantity of cholesterine produced in the brain.

Exp. 4. A medium sized adult dog was put under the influence of ether and the carotid artery, internal jugular, and femoral veins exposed. Specimens of blood were drawn, first from the internal jugular, next from the carotid, and last, from the femoral vein. These specimens were received into carefully weighed vessels, and weighed.

They were then analyzed for cholesterine by the process described on pages 626-629, and the following results obtained:—

	Quantity of Blood. grains.	Cholesterine. grains.	Cholesterine per 1,000 pts.
Carotid,	179.462	0.139	0.774
Internal jugular,	134.780	0.108	0.801
Femoral vein,	133.886	0.108	0.806
Percentage of increase in blood from the jugular, over the arterial blood,			3.488
Do. do. of blood from femoral vein,			4.134

This experiment shows an increase in the quantity of cholesterine in the blood during its passage through the brain and an increase, even a little greater, in the blood passing through the vessels of the posterior extremity. To facilitate the operation, however, the animal was brought completely under the influence of ether, which, from its action on the brain, would not improbably produce some temporary disturbance in the nutrition of that organ, and consequently interfere with the experiment. For the purpose of avoiding this difficulty I performed the following experiments without administering an anæsthetic.

Exp. 5. A small young dog was secured to the operating table, and the internal jugular and carotid exposed on the right side. Blood was taken, first from the jugular, and afterwards from the carotid. The femoral vein on the same side was then exposed and a specimen of blood taken from that vessel. The animal was very quiet under the operation, though no anæsthetic was used, so that the blood was drawn without any difficulty, and without the slightest admixture.

The three specimens were analyzed for cholesterine with the following results:—

	Quantity of Blood. grains.	Cholesterine. grains.	Cholesterine per 1,000 pts.
Carotid,	143.625	0.679	0.967
Internal jugular,	29.956	0.046	1.545
Femoral vein,	45.035	0.046	1.028
Percentage of increase in blood from the jugular, over arterial blood,			59.772
Do. do. of blood from the femoral vein,			6.308

Exp. 6. A large and powerful dog was secured to the operating table and the carotid and internal jugular exposed. Specimens of blood were taken from these vessels, first from the jugular, carefully weighed and analyzed for cholesterine in the usual way. The following results were obtained:—

	Blood. grains.	Cholesterine. grains.	Proportion in 1,000 pts.
Carotid,	140.847	0.108	0.768
Internal jugular,	97.811	0.092	0.947
Percentage of increase in passing through the brain,			23.307

Exp. 5 shows a very considerable increase in the quantity of cholesterine in the blood passing through the brain, while it is comparatively slight in the blood of the femoral vein. The proportion of cholesterine is also large in the arterial blood compared with other observations.

Exp. 6 shows but a slight difference in the quantity of cholesterine in the arterial blood in the two animals; the proportion in the animal that was etherized being 0.774 pts. per 1,000, and in the animal that was not etherized 0.768 per 1,000, the difference being but 0.006; but, as I had suspected, the ether had an influence on the quantity of cholesterine absorbed by the blood in its passage through the brain. In the first instance the increase was but 3.488 per cent, while in the latter it was 23.307. Unfortunately the blood was not taken from the femoral vein. I intended to take blood from the abdominal organs, but after opening the abdomen the struggles of the animal were so violent that this was impossible, and he was killed.

What are our natural conclusions, from the preceding experiments, with regard to the origin of cholesterine in the economy? It has been found that the brain and nerves contain a large quantity of this substance, which is found in none other of the tissues of the body. The preceding experiments, especially Exps. 5 and 6, show that the blood which comes from the brain contains a much larger quantity of cholesterine than the blood which goes to this organ.

The conclusion is, then, that it is produced in the brain, and thence absorbed by the blood.

But the brain is not the only part where cholesterine is produced. It will be seen by Exp. 4 that there is 4.134 per cent, and in Exp. 5, 6.308 per cent of increase in the cholesterine in the passage of the blood through the inferior extremities, and probably about the same in other parts of the muscular system. In examining these tissues chemically, we find that the muscles contain no cholesterine, but that it is abundant in the nerves; and as we have found that the proportion of cholesterine is immensely increased in the passage of the blood through the great centre of the nervous system, taken, as the specimens examined were, from the internal jugular, which collects the blood from the brain and very little from the muscular system, it is rendered almost certain, that in the general venous system, the cholesterine which the blood contains is produced in the substance of the nerves.

If this be true, and if, as I hope to show, the cholesterine be

a product of the destructive assimilation of nervous tissue, its production would be proportionate to the activity of the nutrition of the nerves; and anything which interfered to any great extent with their nutrition would diminish the quantity of cholesterine produced. In the production of urea by the general system, which is an analogous process, muscular activity increases the quantity, and inaction diminishes it, on account of the effect upon nutrition. In cases of paralysis we have a diminution of the nutritive forces in the parts affected, especially of the nervous system, which, after a time, becomes so disorganized, that although the cause of the paralysis be removed, the nerves cannot resume their functions. It is true we have this to a certain extent in the muscles; but it is by no means as marked as it is in the nerves. We should be able then to confirm the observations on animals, by examining the blood in cases of paralysis; when we should find a very marked difference in the quantity of cholesterine, between the venous blood coming from the paralyzed parts, and that from other parts of the body. With this in view I made analyses of the blood from both arms in three cases of hemiplegia, which seemed to me most suitable for such a comparison.

CASE I. Sarah Rumsby, æt. 47, affected with hemiplegia of the left side. Two years ago she was taken with apoplexy, and was insensible for three days. When she recovered consciousness she found herself paralyzed on the left side. Said she had epilepsy four or five years before the attack of apoplexy. Now she has entire paralysis of motion on the affected side, with the exception of some slight power over the fingers, but sensation is perfect. The speech is not affected. The general health is good.

CASE II. Anna Wilson, æt. 23, Irish, affected with hemiplegia of the right side. Four months ago she was taken with apoplexy, from which she recovered in one day with loss of motion and sensation on the right side. She is now improving and can use the right arm slightly. The leg is not so much improved, because she will make no effort to use it.

CASE III. Honora Sullivan, Irish, æt. 40, affected with hemiplegia of right side. About six months ago she was taken with apoplexy, and recovered consciousness the next day, with paralysis. The leg was less affected than the arm, from the first. The cause was supposed by Dr. Flint, the attending physician, to be due to an embolus. Her condition is now about the same as regards the arm, but the leg has somewhat improved.

These cases all occurred at the Blackwell's Island Hospital. The treatment in all consisted of good diet, frictions, passive motion, and use of the paralyzed members as much as possible.

A small quantity of blood was drawn from both arms in these three cases. It was drawn from the paralyzed side, in each instance, with great difficulty, and but a small quantity could be obtained.

The specimens were all examined for cholesterine with the following results:—

Table of Quantity of Cholesterine in Blood of Paralyzed and Sound Sides, in three cases of Hemiplegia.

	Blood.	Cholesterine.	Cholesterine per 1,000.
	grains.	grains.	
Case I. Paralyzed side.	55.458	—	The watch-glass contained 0.031 gr. of a substance, but the most careful examination failed to show a single crystal of cholesterine.
Do. Sound side.	128.407	0.062	
Case II. Paralyzed side.	18.381	—	Same as Case I.
Do. Sound side.	66.396	0.062	
Case III. Paralyzed side.	21.842	—	Same as Case I.
Do. Sound side.	52.261	0.031	

The result of these examinations is very interesting: not a single crystal of cholesterine was found in any of the three specimens of blood from the paralyzed side, while about the normal quantity was found in the blood from the sound side. As the nutrition of other tissues is interfered with in paralysis, it is impossible to say positively from these observations alone, that the cholesterine is produced in the nervous system only. But the nutrition of the nerves is undoubtedly most affected; and this observation, taken in connection with the preceding experiments on animals, seem to settle where the cholesterine is produced.

We may extend our first conclusion, then, and state that the *cholesterine is produced in the substance of the nervous system.*

Before entering upon the character of cholesterine, and inquiring whether it be an excrementitious or a recrementitious product, we will endeavor to follow it out in the system and ascertain if there be any organ which separates it from the blood. In pursuing this question, the method will be adopted that has been employed in investigating its origin; that is, analyzing the

blood as it goes to and comes from certain organs. The organ which we would be led first to examine is the liver, as it is the only gland, the product of which contains cholesterine, which, if not manufactured in the gland itself, must be separated from the blood.

In the first series of experiments which I performed on this subject, I endeavored to show on the same animal the origin of cholesterine in certain parts, and its removal from the body. In these experiments, which were only approximative, as I had not then succeeded in extracting the cholesterine perfectly pure, I commenced with the arterial blood, examining it as it went into the brain by the carotid, analyzing the substance of the brain, then analyzing the blood as it came out of the brain by the internal jugular, examining the blood as it went into the liver by the hepatic artery and portal vein, examining the secretion of the liver, then the blood as it came out of the liver by the hepatic vein, examining also the blood of the vena cava in the abdomen. The analyses of the blood from the carotid, internal jugular, and vena cava have already been referred to, page 678, in treating of the origin of the cholesterine. It will be remembered that there was a large quantity of this substance in the internal jugular, and but a small quantity in the carotid, showing that it was *formed* in the brain. I now give the conclusion of those observations, which bears upon the *separation* of the cholesterine from the blood.

Exp. 7. Specimens of blood were taken from the hepatic artery, portal vein and hepatic vein, and a small quantity of bile from the gall-bladder. These specimens were treated in the manner already indicated in *Exp. 3*; *i. e.*, evaporated and pulverised, extracted with ether, the ether evaporated, and the residue extracted with boiling alcohol, this evaporated, a solution of caustic potash added and then subjected to a microscopic examination.

Blood from the portal vein.—Microscopic examination of the extract from the portal vein showed quite a number of crystals of cholesterine, which are represented in *Fig. 8*. These were observed after the fluid had nearly evaporated.

Blood from the hepatic artery.—Microscopic examination of the extract from the hepatic artery, made after the fluid had nearly evaporated, showed a considerable amount of cholesterine; more than was observed in the preceding specimen. (See *Fig. 9*.) There were also observed a few crystals of stercorine, represented in *Fig. 10*.

Blood from the hepatic vein.—The first examination of the extract from the hepatic vein, which was made just before the potash was added, showed a number of fatty masses with some crystals of stercorine. The solution of potash was then added, and two days after, another careful examination was made, discovering nothing but fatty globules and granules. (See Fig. 11.) The watch-glass was then set aside, and was examined eleven days after, when the fluid had entirely evaporated. At this examination, a few crystals of cholesterine were observed for the first time. (See Fig. 12.) There were also a number of crystals of margaric and stearic acid.

Bile.—All the examinations of the extract from the bile showed cholesterine; the precipitate consisted, indeed, of this substance in a nearly pure state. Fig. 13 represents some of the crystals which were observed in this specimen.

This series of experiments being taken in connection with the first observations on the carotid and internal jugular, while the one series demonstrates pretty conclusively that cholesterine is formed in the brain, the other shows that it disappears, in a measure, from the blood in its passage through the liver, and is found in the bile. In other words, it is formed in the nervous tissue, and prevented from accumulation in the blood by its excretion by the liver. This suggests an interesting series of inquiries; and this fact, substantiated, would be as important to the pathologist as to the physiologist. But in order to settle this important question, it is necessary to do something more than make an approximative estimate of the quantity of cholesterine removed from the blood by the liver. The quantity which is thus removed in the passage of the blood through this organ should be estimated, if possible, as closely as the quantity which the blood gains in its passage through the brain. But this estimate is more difficult. The operation for obtaining the blood, in the first place, is much more serious than that for obtaining blood from the carotid and internal jugular. It is very difficult to obtain the unmixed blood from the hepatic vein; and the exposure of the liver, if prolonged, must interfere with its eliminative function, in the same way that exposure of the kidneys arrests, in a few moments, the flow from the ureter. It is probable, however, that the administration of ether does not interfere with the elimination of cholesterine by the liver as it does, apparently, with its formation in the brain. Anæsthetics, we know, have a peculiar and special action on the brain, but do not interfere with the functions of vegetative life, like secretion and excretion; and, we would suppose, would not interfere

with the depurative function of the liver. It is fortunate that this is the case, for the operation of taking blood from the abdominal vessels is immensely increased in difficulty by the struggles of an animal not under the influence of an anæsthetic, so much so, indeed, that I failed entirely in obtaining any blood from one animal (the one used in Exp. 6), which was not etherized. It was a very powerful dog, and his struggles were so violent that it was impossible to collect the blood accurately from the abdominal vessels, and the attempt was abandoned. With a view of settling the question of the disappearance of a portion of the cholesterine of the blood in its passage through the liver, by an accurate quantitative analysis, I repeated the operation for drawing blood from the vessels which go into, and emerge from the liver. In my first trial the blood was drawn so unsatisfactorily, and the operation was so prolonged, that I did not think it worth while to complete the analysis, and abandoned the experiment. In the following one I was more successful.

Exp. 8. A good-sized bitch (pregnant) was brought completely under the influence of ether, the abdomen laid freely open, and blood drawn, first from the hepatic vein, and next from the portal vein. The taking of the blood was entirely satisfactory, the operation being done rapidly, and the blood collected without any admixture. A specimen of blood was then taken from the carotid to represent the blood from the hepatic artery.

The three specimens of blood were then examined in the usual way for cholesterine, with the following results:—

	Blood. grains.	Cholesterine. grains.	Cholesterine in 1,000 pts.
Arterial blood, . . .	159.537	0.200	1.257
Portal vein, . . .	168.257	0.170	1.009
Hepatic vein, . . .	79.848	0.077	0.964
Percentage of loss in arterial blood in its passage through the liver, . . .			23.309
Do. do. do. of portal vein, . . .			4.460

This experiment proves positively that there was good ground for supposing from Exp. 7, namely, that cholesterine is separated from the blood by the liver; and here we may note, in passing, a striking coincidence between the analysis in Exp. 6, when the blood was studied in its passage through the brain, and the one just mentioned, when the blood was studied in its passage through the liver. *The gain of the arterial blood in cholesterine in passing through the brain was 23.307 per cent, the loss of this substance in passing through the liver is 23.309 per cent.* There must be, of course, the same quantity sepa-

rated by the liver that was formed by the nervous system, it being formed, indeed, only to be separated by this organ, its formation being continuous, and its removal necessarily the same, in order to prevent its accumulation in the circulating fluid. The almost exact coincidence between these two quantities, in specimens taken from different animals, though not at all necessary to prove the fact just mentioned, is still very striking.

It is shown by Exp. 8 that the portal blood, as it goes into the liver, contains but a small percentage of cholesterine over the blood of the hepatic vein, while the percentage in the arterial blood is large. The arterial blood is the mixed blood of the entire system, and as it probably passes through no organ before it gets to the liver which diminishes its cholesterine, contains a quantity of this substance, which must be removed. The portal blood, coming from a limited part the system, contains less of this substance, though it gives up a certain quantity. In the circulation of the liver, the portal system largely predominates, and is necessary to other important functions of this organ, such as the production of sugar and fat. Soon after the portal vein enters the liver, its blood becomes mixed with that from the hepatic artery,* and from this mixture the cholesterine is separated. It is only necessary that blood, containing a certain quantity of cholesterine, should come in contact with the bile-secreting cells, in order that this substance be separated. The fact that it is eliminated by the liver is proven with much less difficulty than that it is formed in the nervous system. In fact, its presence in the bile, the necessity of its constant removal from the blood, which is consequent on its constant formation and absorption by this fluid, are almost sufficient in themselves to warrant the conclusion that it is removed by the liver. This, however, is put beyond a doubt by the preceding analysis of the blood going to and coming from this organ.

Another link, then, is added to the chain of facts which make up the history of cholesterine. The first is that—

Cholesterine is formed in the brain and nervous system, and absorbed by the blood.

* According to Robin, the branches of the hepatic artery are distributed almost entirely in the interlobular plexuses, and on the walls of the hepatic duct and portal vein, and do not find their way into the substance of the lobules.—*Dictionnaire de Médecine, de Chirurgie, de Pharmacie, des Sciences accessoires et de l'Art vétérinaire* de P. H. Nysten; onzième édition revue et corrigée. Par E. Littré et Ch. Robin. Paris, 1858. Article Foie.

The second, which has just been proven, is that—

Cholesterine, formed in these situations, and absorbed by the blood, is separated from the blood in its passage through the liver.

The next question, in following out this line of inquiry, is, What becomes of the cholesterine which is separated from the blood? This question is very easily answered, and necessitates only an examination of one of the products of the liver, the bile.

The Bile.—In the few remarks with which I have prefaced this article, I spoke of the various opinions which are held among physiologists with reference to the function of the bile—some regarding it as purely excrementitious, others placing it among the recrementitious fluids. I detailed experiments which led me to think that it had two distinct functions: one, which is recrementitious, and is probably concerned in digestion to an important degree, but which it is not designed to take up in this connection; the other, which is excrementitious, and which is necessarily taken up in our discussion of the important principle which we are now considering. A glance at the composition of the bile will show that it is an exceedingly complex fluid; and physiological investigations into the destination of certain of its ingredients, by Bidder and Schmidt, Dalton and others, have shown that they are not discharged from the body, but resorbed by the blood; though the failure to detect them in the portal blood by the appropriate tests, shows that in this resorption they probably undergo some alteration.* These substances, which have heretofore been considered the most important ingredients of the bile, though their function is obscure, are the glyco-cholate and tauro-cholate of soda, discovered by Strecker in the bile of the ox in 1848. The following is the composition of the bile given in Dalton's physiology, which is "based on the calculations of Berzelius, Frerichs, and Lehmann."†

* For a very complete account of the bile, with original investigations into the destination of the biliary salts, the reader is referred to an article published by Prof. John C. Dalton, Jr., in the *American Journal of the Medical Sciences*, October, 1857, and the chapter on bile in Dalton's Physiology.

† Dalton's Physiology, second edition, page 158.

Composition of Ox Bile.

Water,	888.00
Glyco-cholate of soda,	90.00
Tauro-cholate of soda,	
Biliverdine,	
Fats,	13.42
Oleates, margarates, and stearates of soda and potassa,	
Cholesterine,	
Chloride of sodium,	
Phosphate of soda,	15.24
Phosphate of lime,	
Phosphate of magnesia,	
Carbonates of soda and potassa,	
Mucus of the gall-bladder,	1.34
	<hr/> 1000.00

Of the above ingredients of the bile, we have the biliverdine, which is simply a coloring matter, the fats, with the oleates, margarates, and stearates, which, with the biliary salts, are said to hold the cholesterine in solution, the chloride of sodium, present in all the animal fluids, the phosphates and carbonates, which are simply excreted, and are also ingredients of the urine, leaving, as the most important constituents, of which the function is least understood, the biliary salts and the cholesterine. The biliary salts are probably recementitious; but the cholesterine is one of the great products of the waste of the system. The bile, then, presents the combined character, so far as its chemical composition is concerned, of a secretion and of an excretion. Let us now contrast these two properties, and see what this fluid has in common with the secretions, and how it obeys the laws which regulate the excretions. In doing this we will first contrast some of the important distinctions between these two classes of products.

Secretions are characterized by certain elements which are manufactured in the substance of the gland, and are found in no other situation. Such is the pancreatine for the pancreatic juice, the pepsin for the gastrid juice, the ptyaline for the saliva, and, we may add, the glyco-cholate and tauro-cholate of soda for the bile.

These substances first make their appearance in the substance of the gland itself; they do not pre-exist in the blood; they are discharged from the gland for a special purpose, and when there is no necessity for their action, the discharge does not take place. Illustrations of this are to be found in the digestive fluids, which are true secretions; only poured when this function is called into action by the ingestion of food, and not discharged from the body, but their elements taken up again by the blood when

their function is accomplished. Thus the gastric or pancreatic fluids are never secreted until food is taken into the alimentary canal, and are resorbed with the digested matters.

The flow of the secretions is intermittent, and the gland, during the period of repose, manufactures the elements of the secretion, which are washed out at the duct when the appropriate stimulus (of food, for example) causes a determination of blood to the organ. The gland manufactures the elements of the secretion, and the blood furnishes the menstruum, the water, by means of which they are dissolved and emptied into the duct. If we expose the pancreas of an animal during the intervals of digestion, it is pale and bloodless; no fluid flows from the duct; but the elements of the pancreatic juice are, nevertheless, in the gland, for if we macerate it in water, we may dissolve them out, and make an artificial pancreatic juice which will have all the reactions and digestive properties of the natural secretion. But if we expose the pancreas of an animal during digestion, the gland is turgid with blood; the secretion flows from the duct, and the products of the gland are being washed out by the blood—a process which we imitated when we dissolved them out by maceration in water. The late brilliant experiments of Bernard have shown that the function of the glands is regulated by the nervous system, and that the galvanization of certain nerves, by which the nervous force is imitated, will cause a determination of blood to the organ, and induce secretion, while the galvanization of other nerves will contract the vessels, and arrest secretion.

The substances which characterize the secretions, as they are manufactured in the glands and do not pre-exist in the blood, do not accumulate in the blood when the gland is removed, or its functions are interfered with.

The distinctive characters of the secretions, in fact, may be summed up thus:—

Their elements first appear in the glands, and do not pre-exist in the blood. They are not discharged from the body (with the exception of the milk, which is destined for the nourishment of the child). Their flow is intermittent. They are destined to assist in some of the nutritive functions of the body.

Excretions, of which the urine may be taken as a type, have entirely different characteristics.

Excrementitious substances do not first make their appearance in the organs which separate them, but are produced in the general system.

They pre-exist in the blood, having been absorbed by this

fluid from the parts of the system in which they are formed, are carried to particular organs, and separated from the blood for the sole purpose of being expelled from the body. An illustration of this is to be found in the urea, which has been detected in the blood and urine, and some of the tissues of the body. This substance, one of the most important excrementitious products, is absorbed by the blood from certain parts of the system, carried to the kidneys, there separated from the blood, and discharged from the body. Though the gastric and pancreatic fluids, and all the secretions proper, are resorbed with the food after they have acted upon it, the urea may remain any length of time in the bladder, but it is never absorbed.

The flow of the excretions is constant. No period of repose is necessary for the gland to manufacture their elements, as they all pre-exist in the blood. Nutrition is constant, and destructive assimilation, or waste, which necessitates nutrition or repair, is likewise constant. The blood supplies all the wants of the system, and receives all the products of its decay. As the blood is continually being impoverished, it must be regenerated from without; and this is done by food, which is prepared for absorption by digestion. The secreted fluids are mostly concerned in digestion, and as this is an occasional process, the secretions are intermittent. But waste is continually going on, and excrementitious substances are continually forming; and while the necessity for the secretions is occasional, the necessity for the excretions is constant. Though the actual discharge of the latter from the body is occasional, they are constantly being separated from the blood, and accumulate in receptacles, whence they are discharged at appropriate intervals. No such receptacles exist for the secretions proper, except in the instance of the milk, which accumulates in the ducts of the mammary gland, and is the only secretion which is discharged from the body.

If the secreting glands take on an excretory function, as is an occasional pathological occurrence, their flow becomes continuous. We have an example of this in the occasional separation of the urea from the blood by the gastric tubuli. When the kidneys become so affected by disease as to be unable to separate the urea from the system, the accumulation of this excrement in the blood frequently induces other organs to attempt its removal. The gastric tubuli take on that function, and produce a fluid which contains urea. The gastric juice, if we may now so term it, is no longer a secretion, but an excretion, and we find that its flow is no longer intermittent and dependent upon the stimulus of food introduced into the stomach, but

is constant, and continues until the irritation caused by the decomposing urea in the stomach induces an inflammation which prevents further secretion. Thus we have an example of an intermittent *secretion*, characterized by a substance manufactured in the gland and not pre-existing in the blood, changed into a constant *excretion*, characterized by a substance which is not manufactured in the gland but pre-exists in the blood.

The substances which characterize the excretions accumulate in the blood when the organ which eliminates them is removed, or its functions are interfered with. It is to this fact that we owed our knowledge that urea pre-existed in the blood. It was detected in that fluid when it had accumulated in animals from which the kidneys had been removed, and in cases of Bright's disease of the kidneys, before our chemical processes were sufficiently delicate to detect it in healthy blood, when the quantity is kept down to a very low standard by its constant elimination by the kidneys.

The characters of the excretions, then, are entirely opposite to those of the secretions.

Their elements pre-exist in the blood, and are not manufactured in the substance of the organs which eliminate them. Their flow is constant. They are separated from the blood merely to be discharged from the body, and are not destined to assist in any of the nutritive functions of the body.

Having thus contrasted the secretions and the excretions, let us examine the bile and note what are the characters which it has in common with either or both of these products.

The bile is characterized by two kinds of principles. One of them, the glyco-cholate and tauro-cholate of soda, *manufactured* in the liver, found in no other fluid than the bile, does not pre-exist in the blood, and associates the bile with the secretions. The other, the cholesterine, pre-exists in the blood and is simply *separated* from it by the liver, giving the bile one of the characters of an excretion.

The biliary salts (the glyco-cholate and tauro-cholate of soda) are discharged into the intestinal canal for a special purpose; and this discharge takes place at the beginning of the digestive act. If we expose the liver and gall-bladder of a dog which has not taken food, we will find the gall-bladder distended with bile; but if we examine these organs when digestion is going on, the gall-bladder will be found nearly empty. It is true that after prolonged fasting the bile is discharged into the alimentary canal, but it must be remembered that it contains another ingredient, the cholesterine, which must be discharged from the

body, as we will see presently. The biliary salts are not discharged from the body. Dr. Dalton has shown that the substances extracted from the contents of the large intestine by evaporation, extraction of the residue with alcohol and precipitation with ether, will not react with Pettenkoffer's test, which is a very delicate test for the biliary salts. I have treated the feces of the human subject in the same way with the same result. These salts, therefore, are not discharged from the body unchanged. The next question to determine is whether they are discharged from the body in a modified form. They contain a certain amount of sulphur, of which, as has been shown by Bidder and Schmidt, only one-fifteenth part of the entire quantity which enters the intestine with the bile can be detected in the feces. As sulphur is an elementary substance, it cannot be decomposed; and the biliary salts, in this passage down the alimentary canal, must be absorbed. It is true that these salts cannot be detected in the blood coming from the intestines, but we cannot detect the pancreatin of the pancreatic juice, the pepsin or lactic acid of the gastric juice in the portal blood, yet these are absorbed by the mucous membrane of the intestinal tube, changed by their union with the elements they have digested. It is probable that an analogous change takes place in the glyco-cholate and taurocholate of soda, which prevents them from being detected in the blood by the ordinary tests. These facts, also, place the bile among the secretions.

On the other hand, cholesterine pre-exists in the blood, having been absorbed by this fluid from certain parts of the system, is carried to the liver, and here separated for the sole purpose of being discharged from the body. The same general remarks apply to this substance as to the urea. This places the bile among the excretions.

The flow of the secretions is intermittent. This is not absolutely true of the bile, but the discharge of this fluid is remittent. Dr. Dalton* has reported a series of interesting experiments upon an animal with a duodenal fistula. In this observation ten grains of dry biliary matter were discharged into the duodenum of a dog weighing thirty-six and a-half pounds, immediately after feeding. At the end of the first hour it had fallen to four grains; it continued at three and a-half to four and a-half grains up to the eighteenth hour, when the quantity was inappreciable; at the twenty-first hour it was one grain, the twenty-fourth, three and a-quarter grains, and the twenty-fifth three grains. The fluid was drawn for fifteen minutes each

* Dalton on the Constitution and Physiology of the Bile. Loc. cit.

time, evaporated to dryness, extracted with absolute alcohol, precipitated with ether, the ether precipitate dried, and weighed as representing the quantity of biliary matter present. These experiments apply to the time when the bile is discharged into the intestine; but as most animals have a gall-bladder, which collects the bile as it is secreted, it does not show when this fluid is formed by the liver. Schwann, Bidder, and Schmidt, Arnold, Köl liker, and Müller, have made experiments bearing upon the latter point, by ligating the ductus communis choledocus and making a fistula into the fundus of the gall-bladder. The experiments of these observers vary somewhat with regard to the time when the secretion of the bile is at its maximum. In the animal referred to on page 620, in which a fistula was made into the fundus of the gall-bladder, the bile was collected for thirty minutes immediately after feeding, one hour after, and then at intervals of two hours during the remainder of the twenty-four hours. The specimens of bile thus collected were carefully weighed, evaporated to dryness, and the proportion of dry residue taken. The accompanying table shows the results of these observations, which were made twelve days after the operation, when the animal, which weighed originally twelve pounds, had lost two pounds. His appetite was ravenous at the time of the experiment.

Table of the variations of the bile in the twenty-four hours. At each observation the bile was drawn for precisely thirty minutes. Dog with a fistula into the gall-bladder. Weight ten pounds.

Time after feeding.	Fresh Bile.	Dried Bile.	Percentage of Dry Residue.
	grains.	grains.	
Immediately,	8.103	0.370	4.568
One hour,	20.527	0.586	2.854
Two hours,	35.760	1.080	3.023
Four hours,	38.939	1.404	3.605
Six hours,	22.209	0.987	4.450
Eight hours,	36.577	1.327	3.628
Ten hours,	24.447	0.833	3.407
Twelve hours,	5.710	6.247	4.325
Fourteen hours,	5.000	0.170	3.400
Sixteen hours,	8.643	0.309	3.575
Eighteen hours,	9.970	0.277	2.778
Twenty hours,	4.769	0.170	3.565
Twenty-two hours,	7.578	0.293	3.866
Twenty-four hours,	15.001	0.885	5.233

This table shows a regular increase in the quantity of bile

discharged from the fistula from the time of feeding up to four hours after. It diminished at the sixth hour, rose again at the eighth hour, but then gradually diminished to the fourteenth hour. We then have a slight increase at the sixteenth and eighteenth hours, and the twentieth hour it falls to its minimum. It then increased slightly the twenty-second hour, and mounted considerably the twenty-fourth hour, when the observations were concluded. Disregarding slight variations in the quantity, which might be accidental, it may be stated in general terms, that *the maximum flow of bile from the liver is from the second to the eighth hour after feeding; during which time it is about stationary. In this experiment it was at its minimum the twentieth hour after feeding.* This observation agrees with those of Bidder and Schmidt as regards the time when the bile begins to increase in quantity; but these observers state that it is at its maximum at the twelfth to the fifteenth hour. This, however, is not material to the question now under consideration. We wished to establish the fact that the quantity of bile secreted varied considerably during the various stages of the digestive act; a character which approximates it to other secretions. The flow of the bile is not intermittent, because it contains a substance which is excrementitious; but it is remittent, having a definite relation to the digestive act, because it contains substances which are recrementitious and are in some way connected with the process of digestion.

The continuous, though remittent, flow of the bile allies it with the excretions. There is no time, in health, when the bile is not separated from the blood. In animals that go through the process of hibernation, the bile continues to be secreted, though no food is taken into the alimentary canal. Nutrition, though much diminished in activity, goes on during this state, and the urea and cholesterine must be separated from the blood. The formation of the bile and urine, therefore, is not interrupted. The bile is secreted also in the fœtus, before any nourishment is taken into the alimentary canal, when none of the other digestive fluids are formed. This character it has in common with the urine, and this places it among the excretions.

The elements of secretion never accumulate in the system when the secretion is interfered with; while the elements of excretion do accumulate in the blood in such cases, and produce their toxic effects. Experimenters have often analyzed the blood for the biliary salts in cases of serious disease of the liver, marked by symptoms of bile poisoning, regarding these as the only important elements of the bile; but they have never been

detected. I have made no observations on this point, for the fact that the glyco-cholates and tauro-cholates of soda do not accumulate in the blood in diseases of the liver has long been settled. This stamps these substances as products of *secretion*; but we will see when some of the pathological conditions of the cholesterine are taken up, that this substance does accumulate in the blood when the functions of the liver are seriously interfered with, which marks it as a product of *excretion*.

It seems to me that enough has been said with regard to the function of the bile to convince the reader that this complex fluid has two important elements which have two separate functions.

First. *It contains the glyco-cholate and tauro-cholate of soda; which are not found in the blood, are manufactured in the liver, are discharged mainly at a certain stage of the digestive process, are destined to assist in some of the nutritive processes, are not discharged from the body, and, in fine, are products of secretion.*

Second. *It contains cholesterine; which is found in the blood, is merely separated from it by the liver, and not manufactured in this organ, is not destined to assist in any of the nutritive processes, but merely separated to be discharged from the body, and is a product of excretion.*

These two propositions, and more especially the second, being established, it becomes our task now to follow out the cholesterine after it has been discharged from the liver into the small intestine. If it be discharged from the body it must be by the rectum, and to complete the history of cholesterine we find it necessary to study the feces.

The Feces.—It is not my object to consider all the effete matters which go to make up the feces, though it must be acknowledged that our information on this subject is very limited. Following the cholesterine in its passage down the alimentary canal has opened a new subject for investigation, which it will be impossible to do entire justice to in this paper. There is a field for a long series of investigations into this part of our subject, which I hope to be able to cultivate to some extent in the future, and add something to the history of the substance we have been considering. At present I shall only endeavor to demonstrate the fact that cholesterine, in a modified form, is discharged with the feces, and not attempt to treat of the conditions which modify the excretion of this substance (upon which as yet I have no data), which are of the last importance to the practical physician.

It is stated by some of the most reliable authors on physiology and physiological chemistry that cholesterine is found in

the fecal matters. Robin and Verdeil say: "*Ce principe immediat se trouve a l'etat normal dans le sang, la bile, le foie, le cerveau, les nerfs, le cristallin et les matieres fecales.*" Many other authors refer to it as found in the feces, and it was with that belief, that, in the experiments which form the basis of this article, I deferred my analyses of the feces till I had completed the observations on the blood, and then analyzed them, satisfied that I would find cholesterine, with the view to determine the variations, etc., in its quantity. When after a careful and prolonged examination of many specimens of feces I was unable to extract any cholesterine, I endeavored to ascertain what observer had established its presence. Though it is mentioned by so many as present in the feces, I could find no mention of any one who had established this point; and in some of the analyses of Simon, I found that he had noted its absence in certain specimens of feces. I found also that Marcet, who published some elaborate analyses of the feces in the *Philosophical Transactions*, in 1854 and 1857, noted the absence of cholesterine in the normal feces of the human subject. We have already seen how conclusively the experiments on the blood from various parts of the system point to the excrementitious character of the cholesterine, showing us even in what part of the system it is found, and where it is eliminated; but it is undoubtedly one of the most important characters of an excretion that it should be discharged from the body, and I was unable for a time to convince myself that it was discharged. After evaporating the feces to dryness, pulverizing, extracting thoroughly with ether, decolorizing with animal charcoal, evaporating the ether and extracting the residue with boiling alcohol, I allowed the alcohol to evaporate, added a solution of caustic potash, and kept the mixture at a temperature near the boiling point for three and a-quarter hours. The potash was then carefully washed away in a filter, the residue redissolved in ether and extracted with hot alcohol as before, and the alcoholic extract set aside to evaporate. A number of days passed without any signs of crystallization. The residue was, of course, non-saponifiable; but it differed from the cholesterine by being melted at a much lower temperature, though it presented the red color with sulphuric acid which is said to be characteristic of the latter substance. It was examined carefully with the microscope daily, and after five or six days, to my great satisfaction, crystals began to form; but they were at first so indistinct that their form could not be clearly made out. These crystals, however, increased in size and number, and in a short time presented all the characteristics of *seroline*. In about ten

days the whole mass had crystallized, making one of the most superb exhibitions of crystals that could be imagined. The seroline crystallizes in the form of delicate transparent needles, which have a beauty under the microscope which could be but poorly imitated by the most delicate steel plate engraving. This substance, from its being found in such large quantities in the feces, I have spoken of as *stercorine*.

Before taking up the changes which the cholesterine undergoes in its passage down the alimentary canal, I will say a few words with regard to the stercorine, which will play an important part in this connection.

[To be continued.]

SALIVARY CALCULUS.

Reported by L. C. LANE, M.D., Professor of Physiology in the Medical Department of the University of the Pacific, San Francisco.

A few weeks ago, I was consulted by a gentleman in reference to a tumor situated in the soft parts immediately posterior to the symphyris of the maxilla inferia. On examination, I found that the tissues around the orifice of the excretory duct of the sub-lingual gland were much hypertrophied, and elevated in crest-like ridges, similar to a cock's comb, some of which prominences were nearly one-third of an inch in height, and were in a high state of inflammation. The salivary secretion was not interfered with from the duct, but it was continually being poured out in much profusion. On examination of the soft parts beneath the posterior to the chin, indurated enlargement was readily perceived in them. The appearance of the whole was such as to awaken the suspicion that the tumor was of a malignant character, and perhaps might finally require extirpation, in order to effect either a palliative or a permanent cure.

The patient was ordered some simple topical application to the part, together with the use of dilute aqua chlorinata, as a lotion for the mouth, of which the secretions were exceedingly fetid, and ordered him to return in a few days. On his return the next time, there was found to be a small amount of purulent matter escaping from the outlet of the salivary gland. A small probe was introduced into this duct, yet nothing unusual could be felt. The patient returned again in nearly a week afterwards; when I found that an opening had formed in the tumor, more than half an inch behind the exterior to the normal excretory duct of the sub-lingual gland, inside of the mouth and close to the jaw; from this opening, he said that he had "picked out a

small stone." The stone proved to be a salivary calculus, weighing nearly an eighth of an ounce.

This concretion was found to be composed of concentric layers of white lime-like substance. Upon pulverizing a small portion of it, and testing with a solution of nitrate of silver, the yellow reaction was shown which characterizes the crystalline phosphates,—showing that it was chiefly composed of the phosphate of lime.

After the discharge of this calculus, the ranula-like enlargement beneath the tongue rapidly subsided, and the man was restored to usual health. On inquiry, I learned that this tumor had been of several months' standing, previous to his applying for any medical assistance; that sometimes it had been much swollen and painful, when the swelling would subside again.—*San Francisco Medical Press.*

VACCINATION IN WHOOPING-COUGH.

To the Editor of the *Lancet*,

SIR:—During the spring of this year, pertussis prevailed epidemically amongst children in this parish and surrounding district. As several of them had not been vaccinated, I availed myself of the opportunity of trying the effects of vaccination as a remedy for that disease.

I selected ten cases of uncomplicated whooping-cough. A few days after its employment, I found the symptoms greatly mitigated—the severity of the cough was much lessened, and the intervals between the paroxysms were lengthened. In all the cases the disease progressed favorably, and was shorter in duration than it usually is by the ordinary method of treatment.

The ages of the children varied from three months to two years, and the time of employing it was about the third week of the disease. No medicine was used in any of the cases, with the exception of gentle laxatives. Vaccination as a remedy for whooping-cough was first proposed in Germany, and is not only practised in that country, but also in America.

About thirty years ago, it was introduced into this country, and although favorably spoken of at the time, yet it was allowed to fall into disuse. Whether children so treated will enjoy an immunity from small-pox, I am unable to say; but I may mention that in three of the cases in which I attempted to revaccinate after the removal of the disease, the virus had no effect.

I am, Sir, your obedient servant,

R. C. RUSSEL, L.R.C.S.E.

—*London Lancet.*

Book Notices.

THE DENTIST'S MEMORANDUM. A Book of Engagements, and Manual of Ready Reference. For 1863. By C. M. CLEVELAND, M.D., Cincinnati: BRADLEY & WEBB, Printers.

This is a book of blanks and references, designed for the use of Dentists, and to serve the same purpose with them as the "Physician's Visiting List and Memorandum Book," does to the practitioner of medicine. We think the dentists will appreciate it as a very useful work, and will patronize it accordingly.

ON MEDICAL PROVISION FOR RAILROADS, AS A HUMANITARIAN MEASURE, AS WELL AS A SOURCE OF ECONOMY TO THE COMPANIES. By EDMUND S. F. ARNOLD, M.D., Fellow of the New York Academy of Medicine, &c., &c. New York: BAILLIERE BROTHERS, 440 Broadway. 1862.

This is a pamphlet of 47 pages, embracing two papers; one read before the New York State Medical Society, Feb. 5th, '62, and the other before the Surgical Section of the New York Academy of Medicine, Oct. 28, 1862. The subject discussed in these papers, namely, the establishment of better provisions for the care of persons injured on railroads, is certainly worthy of careful consideration. The author has evidently bestowed upon it much attention, and his papers should be extensively circulated and read.

The outline of the plan advocated by Dr. ARNOLD, is contained in the three following resolutions, appended to the paper read to the Surgical Section of the Academy of Medicine, and adopted by that Section, viz.:—

1st. That in the opinion of this body the loss of many lives would be avoided, and a great diminution of suffering brought about by the adoption of a system of local medical provision on our railroads to meet the cases of casualty occurring thereon.

2d. That such a medical provision could readily be made by fitting up a small room at main stations, and at distances not more than ten miles apart, where practicable, for temporary hospital purposes, and by providing the same with suitable apparatus, and appointing a competent surgeon in the neighborhood to attend on call as occasion may arise.

3d. That, when important stations are too far apart to admit of such an arrangement, suitable apparatus should be carried in the cars themselves, and stations be established where the most competent practitioners of surgery are to be found.

CHARTER, CONSTITUTION, BY-LAWS, AND FEE-BILL OF THE EATON MEDICAL SOCIETY, AT EATON, OHIO.

We have received a copy of this pamphlet from Dr. R. WALLACE, of Lewisburgh, Ohio; for which he has our sincere thanks.

Editorial.

WM. HOPPS ON TRIAL FOR MURDER.

A MEDICO-LEGAL CASE.

In a medico-legal aspect, the trial of Wm. Hopps, now (Dec. 25th,) progressing in the Circuit Court, is of much interest. The following, copied from the report in the *Chicago Daily Times*, states very fairly the grounds on which the defence is made, while the testimony of Dr. McFARLAND will be read with special interest. The opinions expressed by Dr. McFARLAND, in relation to the mind of the prisoner, were fully sustained by all the medical witnesses, who were called on to testify in the case:—

Yesterday was the sixth day of the trial of William Hopps in the Circuit Court of this county, for the murder of his wife. The fact of the commission of the homicide by the prisoner has not been denied by counsel for the defence, but, upon the other hand, openly admitted. The defence rest their whole case upon the plea of insanity. The testimony has been tedious, by reason of its great length, and we trust is about drawing to a close. The defence have unquestionably proved the actions of the prisoner's mind at least very morbid and erratic. He seems to have labored under a delusion of his wife's infidelity, and has assigned for his belief the most frivolous reasons, having no bearing upon the case, but which, however, seemed to him the most conclusive proofs, establishing the truth of his suspicion beyond the possibility of a doubt. For a long series of years,

commencing with a trivial lawsuit about a horse, he has imagined that his neighbors had combined against him, and that the Masons, of which order he was a member, were seeking his life. He did not know his most intimate friends upon some occasions, and was subject at times of mental depression or hilarity. His suspicion of his wife found vent in torrents of abuse, principally poured out during the night time. He was restless, uneasy, singular. From these things, and many others, including his manner, appearance, voice, incoherent conversation, rarely confining himself to one subject, but wandering among ideas suggested by the subject before his mind, his physical condition, pulse from ninety to one hundred and twenty, whereas it should be about seventy, his apparent want of realization of guilt, the insanity of his brother, and his own seeming justification of his crime, and other things occurring to medical men, upon a careful examination, have induced some of the most scientific men in the State, including the Superintendent of the State Insane Asylum, to pronounce him, in the most unequivocal manner, insane and incapable of exercising any judgment in the commission of the crime.

THE TESTIMONY OF DR. MCFARLAND.

Andrew McFarland called and sworn upon the part of the defence:

"I have been a physician for the past twenty-five years, and am now the Superintendent and Physician of the Illinois Insane Asylum. The treatment and management of the insane is now the exclusive study of my life. I had two interviews last Wednesday with the prisoner; I was not introduced to him in my real capacity but as a mere casual caller. I made no special examination of the physical condition of the prisoner, but was struck with his remarkable outward appearance. There were but three expressions to his countenance, which were non-responsive to the spirit of his narrations. One expression of his face was blank solidity; another was expression of profound conclusion, mingled with inquiry, when he thought he had established a fact; the third expression was when he smiled. The prisoner has but one laugh, it cannot be called idiotic or either silly, but a fatuous laugh. The pupil of his eye is immoveable, neither expanding or contracting with the admission or exclusion of light. I believe it has passed beyond the control of his intellect, and only responded to the play of his passions, and I thought I could detect something fiendish in it. When put upon a train of ideas his mind seemed to labor with difficulty,

and it travelled off to collateral facts as a matter of relief or rest. When I was introduced to him I expressed surprise that he could be a prisoner, and this made it incumbent upon him to tell me the circumstances of his arrest. He told me the various stories others have given to the jury—the commencement of his troubles at the time of the horse difficulty, the toast, the onions, the veal, and the circumstances at the Sherman House about the Masons, and they all struck me as the creations of his fancy. His voice, like his countenance, never changes, except when he has reached and expressed a conclusion of his wife's infidelity, when it dropped into a kind of pitiful monotone. After giving the names of several persons with whom he knew his wife had been unfaithful, he used the expression 'and, indeed, with almost everybody,' as if he thought her criminality was indiscriminate. The measure of the disease of the prisoner's brain may be classed under the single idea of an insane delusion, which is a belief in the reality of things which can have no existence, according to any probable experience or testimony; something in violation of universal experience. All definitions of insanity are more or less fallacious and inaccurate, on account of the peculiar disease to which they are applied, and in my definition of an insane delusion I do not mean that the facts which are believed to be true must in all cases be facts which cannot exist under any circumstances that are impossible; but that their existence, if depending upon the proofs the lunatic adduces for his belief, would be an impossibility or improbability. A delusion has an infinitely stronger effect upon the mind of the subject than the sober connection of a fact can have upon the mind of a rational person. Mr. Frenchazel, lately confined in the Illinois Insane Asylum, is a case in point. His mind was unimpaired, save in a single respect: he imagined the sheriff was after him for the purpose of hanging him. He was confined in the fourth story of the building, and the window of his room was secured by grating deemed to be sufficiently strong to resist the strength of any man. Frenchazel, laboring under his delusion, fancied the sheriff was ascending the stairs, and, tearing the grating from his window, threw himself out upon the brick pavement, and was, of course, killed by the fall. The conviction of the fact that the sheriff was approaching with just such intentions would not have impelled a sane man to throw himself from that window. I believe if a man was laboring under the delusion that it was necessary for him to burn up his house, he would lay it upon the fire without a second's hesitation. These delusions are as variable as the imagination of man, and

there exists no possible combination of facts out of which they cannot be fashioned. Rarely any two delusions are alike. The prisoner may have two brothers like himself laboring under insane delusions; one may imagine himself an apostle sent to convert the world, while the other may imagine that he owns the Bank of England, but they all denote the same degree of insanity. The first will do nothing more than preach upon the street corners, the second may do nothing worse than squander his means, imagining that he has an inexhaustible mine upon which to draw after all has been spent. While the prisoner, whose delusion is that his wife is a prostitute, will commit homicide, and the same conclusion which would make the one brother a street preacher and the other a spendthrift, with their peculiar delusions, would make the prisoner a homicide with his. It would inevitably come sooner or later. The condition of the prisoner is somewhat remarkable: his delusion is clear and unmixed and runs completely through the texture of his mind, and yet his mind, on any matter disconnected with the subject of the delusion, is perfectly clear. The number of patients in the insane asylum with minds as clear as that of the prisoner is very few, but over three-fourths of the patients now under my charge have delusions less plainly marked and deep and less apparent in their manifestations than the delusion under which the prisoner is laboring. Mr. Frenchazel, to whom I have alluded, was afflicted with an insanity much like that of the prisoner; he was a man of more original intelligence and education; he bore an unblemished character; was accurate in his transactions of business; had acquired considerable wealth and had an accurate idea of the value of money and its relations to any article which he wished to sell or buy. He went insane from no known cause occurring at the time, but really from an hereditary disposition. An insane delusion that a wife was untrue, operating for years upon a nervous temperament, would sooner or later result in homicide. It might occur sooner or later, but it would eventually occur. The testimony I have heard in this case has confirmed the opinion I have expressed with reference to the prisoner. Homicides committed by insane persons are always marked by unusual atrocity and malignity. The action of the defendant is that of a man who feels justified in his own mind by the delusion which has taken possession of his faculties. A man who always has one fixed delusion when he becomes intoxicated, though it may never attend him when sober, may be regarded as insane and liable to deport himself as such at any moment. From my knowledge of insane persons

I could not be imposed upon in this case by stimulation or deception; this is a form of insanity which cannot be stimulated, unless the person attempting it is profoundly acquainted both with the subject of insanity and the arts of stimulation."

Here the court adjourned until 2 o'clock P. M., and at that hour reassembled and continued the examination of Dr. McFarland:

Cross-Examination.—"Delusions may be excited by stimulants, by ardent spirits, riding in the sun, or any other excitants, and there may be cases where the delusion is attributable to liquor. I am of the opinion that the prisoner's insanity is paroxysmal in its character, and is attended with an increased appetite for liquor. It is a well-known fact in asylums that in such paroxysms the subject has an increased desire for stimulants, and, unless they are given, he becomes worse. Dr. Allen gave me the first intimation I had of this case, gave me an outline of it, and asked what the probable expense would be of securing my attendance upon the trial. I made a calculation upon what my actual disbursements would be and replied accordingly. Fifty dollars is the sum I named; I deemed my time paid for by the people, and that I have no right to charge for that. Mr. McComas suggested to me that I had better not visit the prisoner alone. There is a difference between insanity and jealousy, but Othello's jealousy was carried beyond the bounds of reason. If the prisoner knew his act was wrong, though he may have committed it under an irresistible impulse, it is possible for him to have an idea of right and wrong in the abstract, and still in this particular act has been incapable of determining between right and wrong; in such case he should not be punished. If the prisoner had expressed any sincere regrets at the commission of the deed, I should regard it as an evidence that he knew it was wrong; taking measures to secrete the knife would be no indication of it. I do not think liquor alone induced the action or contributed to it; he would have done it quite as quickly sober or drunk. Liquor, by operating as an excitant for a term of years upon his constitution, may have brought him sooner into insanity, and in this way it may have contributed indirectly to bringing about the delusion under which he killed his wife, but, in causing the homicide at that particular time and place, it had but a secondary place, if one at all. He would have killed his wife any how; a homicide act is the natural result of such delusions. Had he been simply intoxicated at the time he would have ex-

pressed some contrition afterwards, and pride would not prevent him."

By the Court.—"Intellectual insanity is when the intellectual organs are affected, and consists in a disturbed state of thought with no particular moral misconceptions. The idea of moral insanity, in which the intellectual powers are not disturbed, is erroneous. There is usually more or less moral perversion with all cases of intellectual insanity. Liquor excites the passions, makes a person pugnacious or angry, but in the selection of objects upon which to vent itself it is indiscriminate and diffuse, as liable to select one as another, delusions is special, and any dislike springing from it attaches always to particular persons. There is no such fixedness in a drunken man. Liquor simply excites. A man laboring under a delusion may be impelled by an impulse which overthrows his will to do a deed he knows to be wrong."

Direct examination resumed.—"I heard some regrets from the prisoner myself, but they appeared to be of a general nature, such as regret that his wife had been untrue, regret that his life had been unhappy, regret at the grief into which his act had plunged his family, and regret that his wife's course had rendered necessary the commission of the deed. The act, as a righteous one, seemed ever to be justified in his mind. The condition of the pulse alone is of little importance, but when taken in connection with other facts becomes strong corroborative evidence."

P.S.—Since the above was in type, the trial has been brought to a close: and the jury returned a verdict of Guilty of Wilful Murder. The chief ground on which the jurors were induced to set aside the unanimous testimony of medical witnesses, was doubtless the belief that whatever mental impairment or derangement existed, had been the result of the long continued and inordinate use of intoxicating liquors. A motion has been made for a new trial.

AMERICAN MEDICAL ASSOCIATION.

"Since the commencement of the rebellion, with the exception of the American Medical Association, the medical societies, state and local, have exhibited commendable activity. They have all had their stated meetings, and the discussions have, in general, been unusually interesting. In our opinion, the National Association, the parent society, should have held its annual meeting, but the committee determined otherwise. The same reasons which then influenced them to adjourn the meeting another year, still exist, and in three-fold intensity."—*American Med. Times.*

The "reasons" that induced the Committee of Arrangements

to notify an adjournment of the annual meeting, were simply the earnest solicitations of officers and members of the association, in almost every section of the country. Of a score of letters received by the committee from officers and prominent members of the association located in Boston, New Haven, New York, Troy, Albany, Philadelphia, Cincinnati, and St. Louis, only two were in favor of holding the annual meeting last June. The Committee of Arrangements are ready to provide for the meeting whenever the profession will attend. Shall we have the meeting next June? Will our professional brethren give us their views on the subject without delay?

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.—We have received the advance sheets of Volume I. of this Society, containing several valuable papers; and an abstract of the discussions elicited by them. We shall notice them more fully hereafter.

SICK AND WOUNDED IN WASHINGTON AND VICINITY.—There are at this date, 13,263 sick and wounded soldiers in the various hospitals in Washington, Georgetown, and Alexandria. In the hospitals at Frederick there are 2,985, and at Hagerstown and Harper's Ferry about 3,000.—*Philadelphia Medical & Surgical Reporter*.

Surgeon J. V. Z. BLANEY, United States Volunteers, has been ordered to report to Gen. VIELE, at Norfolk, Va.

Ass't-Surgeon C. C. Dumreicher, U.S.A., has arrived at San Francisco, Cal., *en route* to Camp Pickett, San Juan Island.

PROVISION FOR TAKING CARE OF THE WOUNDED IN BATTLE.—During the present rebellion, much complaint has been made on account of inadequate provisions for promptly taking care of the wounded during and after a battle.

The following order, issued under the direction of Gen. McClellan, before he was removed from the command of the army of the Potomac, will show that no such complaints need be

made in future, if the order is obeyed with any degree of efficiency.

We also copy from the *Medical and Surgical Reporter*, the Surgeon-General's new bill of fare for hospitals:—

FIELD HOSPITALS IN THE ARMY OF THE POTOMAC.

CIRCULAR.

HEADQUARTERS ARMY OF THE POTOMAC,
Medical Director's Office, October 30, 1862.

In order that the wounded may receive the most prompt and efficient attention during and after an engagement, and that the necessary operations may be performed by the most skilful and responsible surgeons at the earliest moment, the following instructions are issued for the guidance of the Medical Staff of this Army; and Medical Directors of Corps will see that they are promptly carried into effect:

Previous to an engagement there will be established in each Corps a Hospital for each Division, the position of which will be selected by the Medical Director of the Corps.

The organization of this Hospital will be as follows:

- 1st. A Surgeon in charge;
One Assistant-Surgeon to provide food, shelter, etc.;
- One Assistant-Surgeon to keep the records, etc.
- 2d. Three Medical Officers to perform operations; three Medical Officers as Assistants to each of these Officers.
- 3d. Additional Medical Officers and Hospital Stewards and Nurses of the Division.

The Surgeon in charge will have general superintendence, and be responsible to the Surgeon-in-Chief of the Division for the proper administration of the Hospital.

The Surgeon-in-Chief of Division will detail one Assistant-Surgeon, who will report to, and be under the immediate orders of, the Surgeon in charge, and whose duties shall be to pitch the Hospital Tents and provide straw, fuel, water, blankets, etc.; and, when houses are used, to put them in proper order for the reception of wounded. This Assistant-Surgeon will, when this shall have been accomplished, at once organize a kitchen, using for this purpose the Hospital mess-chest and the kettles, tins, etc., in the ambulances. The supplies of beef stock and bread in the ambulances, and of arrow root, tea, etc., in the hospital wagon, will enable him to prepare quickly a sufficient

quantity of palatable and nourishing food. All the Cooks, and such of the Hospital Stewards and Nurses as may be necessary, will be placed under his orders for these purposes.

He will detail another Assistant-Surgeon, whose duty it shall be to keep a complete record of every case brought to the Hospital, giving the name, rank, company, and regiment, the seat and character of injury, the treatment, the operation if any be performed, and the result; which will be transmitted to the Medical Director of the Corps, and by him sent to this office.

This officer will also see to the proper interment of those who die, and that the grave be marked with a *head-board*, with the name, rank, company, and regiment, legibly inscribed thereon. He will make out two "tabular statements of wounded," which the Surgeon-in-Chief of Division will transmit within thirty-six hours after a battle; one to this office, (by a special messenger, if necessary), and the other to the Medical Director of the Corps to which the hospital belongs.

There will be selected from the Division by the Surgeon-in-Chief, under the direction of the Medical Director of the Corps, three medical officers, who will be the operating staff of the hospital, with whom will rest the immediate responsibility of the performance of all important operations. In all doubtful cases they will consult together, and a majority shall decide upon the expediency and character of the operation. These officers will be selected from the Division without regard to rank, but *solely* on account of their known prudence, judgement, and skill. The Surgeon-in-Chief of the Division is enjoined to be specially careful in the selection of these officers, choosing only those who have distinguished themselves for surgical skill, sound judgment, and conscientious regard for the highest interest of the wounded.

There will be detailed three medical officers to act as assistants to each one of these officers, who will report to him, and act entirely under his direction.

It is suggested that one of these assistants be selected to administer the anæsthetic. Each operating surgeon will be provided with an excellent table from the hospital wagon, and with the present organization for field hospitals, it is hoped that the confusion and the delay in performing the necessary operations so often existing after a battle, will be avoided, and all operations hereafter be *primary*.

The remaining medical officers of the division, except one to each regiment, will be ordered to the Hospital to act generally as assistants and dressers.

Those who follow regiments to the field will establish them-

selves, each one at a temporary depot, at such a distance or situation in the rear of his regiment, as will insure safety to the wounded, where they will give such aid as is immediately required; and they are here reminded, that whilst no personal consideration should interfere with their duty to the wounded, the grave responsibilities resting upon them render any unnecessary exposure improper.

The Surgeon-in-Chief of the Division will exercise general supervision, under the Medical Director of the Corps, over the medical affairs in his Division. He will see that the officers are faithful in the performance of their duties in the Hospital and upon the field; and that, by the Ambulance Corps, which has heretofore been so efficient, the wounded are removed from the field carefully and with despatch. Whenever his duties permit, he will give his professional services at the Hospital, and will order to the Hospital, as soon as located, all the Hospital wagons of the brigades, the Hospital tents and furniture, and all the Hospital stewards and nurses. He will notify the captain commanding the Ambulance Corps, or, if this be impracticable, the first lieutenant commanding the division ambulances, of the location of the Hospital.

No medical officer will leave the position to which he shall have been assigned without permission; and any officer so doing will be reported to the Medical Director of the Corps, who will report the facts to this office.

Medical Directors of Corps will apply to their Commanders on the eve of a battle for the necessary guard and men for fatigue duty. This guard will be particularly careful that no stragglers be allowed about the Hospital, using the food, etc., prepared for the wounded.

No wounded will be sent away from any of these Hospitals without authority from this office.

Previous to an engagement a detail will be made by Medical Directors of Corps of the proper number of medical officers, who will, should a retreat be found necessary, remain and take care of the wounded. This detail the Medical Directors will request Corps Commanders to announce in orders.

The skilful attention shown by medical officers of this army to the wounded upon the battle fields of South Mountain, Crampton's Gap, and the Antietam under trying circumstances, gives the assurance that, with this organization, the Medical Staff of the Army of the Potomac can with confidence be relied upon under all emergencies to take charge of the wounded entrusted to its care.

Blank form of Report to the Medical Director.

TABULAR STATEMENT of wounded in at the
day of , 186

REGION OF BODY WOUNDED.	MISSILE.				AMPUTA- TIONS.		Other operations.	CHLORO- FORM.		TOTAL.
	Cannon Ball.	Shell.	Bullet.	Other.	Primary.	Secondary.		Given in.	Deaths from.	
Head,										
Neck,										
Chest,										
Abdomen,										
Back and spine,										
Hips and genitals,										
Shoulder,										
Arm,										
Forearm and hand,										
Thigh,										
Leg,										
Foot,										
OTHER OPERATIONS.										
TOTAL,										

This report will be sent to the Medical Director of the Army (by special messenger, when practicable) within thirty-six hours after a battle.

....., Surgeon,

JONA. LETTERMAN,

Surg. and Med. Director.

The Surgeon-General's New Bill of Fare for the Hospitals.—The following diet table has been prepared by Surgeon-General Hammond, and the following order has been issued:—

“Medical officers who receive this Diet Table are directed to adopt it immediately in the hospitals under their charge, and to comply strictly and carefully with its provisions for thirty days, keeping during that period an accurate account of expenditure from the hospital fund. At the end of that time they will re-

port the results of this experimental trial, its effects upon the sick and upon the hospital fund, and will make such suggestions as they may deem appropriate, the object being to test the practical operation of the Diet Table, before adopting it as a standard for the General Hospitals. It is recommended that the diets be prepared according to receipts in the Steward's Manual.

One Day Diet, Avoirdupois weight.—Full Diet.

Meat, oz.....16	Indian Meal, oz....1-60	Milk, oz.....8
Bread, oz.....18	Salt, gill.....0-16	Butter, oz.....1
Potatoes, oz.....8	Coffee, oz.....0-80	Flour, oz.....0-25
Other vegetables, oz. 8	Tea, oz.....0-12	Molasses, gill.....0-32
Rice, Hominy, or	Sugar, oz.....2-40	Vinegar, gill.....0-32

Tuesday—in lieu of Fresh Meat.

Pork, oz.....8	Beans, gill.....0-64
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Half Diet.

Meat, oz.....8	Indian Meal, oz....1-60	Milk, oz.....8
Bread, oz.....16	Salt, gill.....0-16	Butter, oz.....1
Potatoes, oz.....6	Coffee, oz.....0-80	Flour, oz.....0-25
Other vegetables, oz. 6	Tea, oz.....0-12	Molasses, gill.....0-32
Rice, Hominy, or	Sugar, oz.....2-40	Vinegar, gill.....0-32

Chicken Diet.

Fowl, oz.....12	Tea, oz.....0-24	Milk, oz.....8
Bread, oz.....18	Sugar, oz.....2-40	Butter, oz.....1
Salt, gill.....0-16		

Milk Diet.

Bread, oz.....14	Milk pt.....3	Sugar, oz.....1
Rice, oz.....2		

Beef-Tea Diet.

Beef (without bone)	Salt, gill.....0-32	Sugar, oz.....2
oz.....8	Tea, oz.....0-24	Milk, oz.....4
Bread, oz.....12		

Articles furnished on extra orders for special cases.

Fish.	Oranges.	Corn Starch.
Oysters, raw.	Lemons.	Tapioca.
Oysters, stewed.	Fruits.	Crackers.
Clam soup.	Ice.	Toast.
Vegetables, (special).	Barley-water.	Chocolate.
Milk.	Rice-water.	Cocoa.
Sugar, white.	Jelly-water.	Blanc Mango.
Sugar, brown.	Lemonade.	Wine Whey.
Barley.	Veal Cutlet.	Brandy.
Cracked Wheat.	Ham, boiled.	Whiskey.
Beef Steak.	Poultry.	Wine, Sherry.
Beef Essence.	Game.	"
Beef Extract.	Eggs.	Porter.
Mutton Chop.	Gruel, Corn Meal.	Ale.
Mutton Broth.	Gruel, Oat Meal.	Cider.
Wine Jelly.	Farina.	Milk Punch.
Custard.		

Low Diet.

Meat, oz.....	8	Sugar, oz.....	2.4	Rice, Farina, Corn
Bread, oz.....	14	Milk, oz.....	8	Starch, or Bread
Salt, gill.....	0.16	Butter, oz.....	1	made into Pud-
Tea, oz.....	0.240			ding, oz.....
				2

Daily Meals—Full Diet—Sunday.—Breakfast.

Coffee, pt.....	1	Butter, oz.....	$\frac{1}{2}$	Molasses, gill.....	0.32
Bread, oz.....	6	Hominy, boiled, oz...	2		

Dinner.

Roast Beef, oz.....	16	Other vegetables, oz.	8	Rice Pudding.....
Potatoes, oz.....	8	Bread, oz.....	6	

Supper.

Tea, pt.....	1	Bread or crackers,		Cheese, oz.....	3
		oz.....	6		

Monday.—Breakfast.

Coffee, pt.....	1	Butter, oz.....	$\frac{1}{2}$	Cold Meat, oz.....	4
Bread, oz.....	6				

Dinner.

Beef Soup, pt.....	1 $\frac{1}{2}$	Bread, oz.....	6	Other vegetables, oz.	8
Beef Soup Meat, oz.	12	Potatoes, oz.....	8		

Tea.

Tea, pt.....	1	Bread, oz.....	6	Butter, oz.....	$\frac{1}{2}$
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Tuesday.—Breakfast.

Coffee, pt.....	1	Butter, oz.....	$\frac{1}{2}$	Meat Hash with	
Bread, oz.....	6			Vegetables, oz.....	8

Dinner.

Pork } Baked, oz... 8	Potatoes, oz.....	8	Bread, oz.....	6
Beans } or in Soup,	Other vegetables, oz.	8	Indian Pudding.	
gill.....				
				0.64

Tea.

Tea, pt.....	1	Butter, oz.....	$\frac{1}{2}$	Fruit, stewed, oz.....	4
Bread, oz.....	6				

Wednesday.—Breakfast.

Coffee, pt.....	1	Butter, oz.....	$\frac{1}{2}$	oz.....	2
Bread, oz.....	6	Indian Meal, boiled		Molasses, gill.....	0.32

Dinner.

Beef recently corned, or Ham boiled, oz. 16	Potatoes, oz..... 8 Other vegetables, oz. 8	Bread, oz..... 6 Pickles, oz..... 1
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Tea.

Tea, pt.....	1	Bread, oz.....	6	Butter, oz.....	$\frac{1}{2}$
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The above will serve as a sample of the full diet table, and the following of the

Half Diet.—Sunday.—Breakfast.

Coffee, pt.....	1	Butter, oz.....	$\frac{1}{2}$	oz.....	2
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Bread, oz..... 6	Indian Meal, boiled,	Molasses, gill.....0 32
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Dinner.

Beef Broth, pt..... 1	Bread, oz..... 4	Other vegetables, oz. 6
Beef Broth Meat, oz. 8	Potatoes, oz..... 6	Rice Pudding.

Tea.

Tea, pt..... 1	Bread, oz..... 6	Butter, oz..... ½
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Monday.—Breakfast.

Coffee, pt..... 1	Bread, oz..... 6	Butter, oz..... ½
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Dinner.

Beef Soup, pt..... 1	Bread, oz..... 4	Other vegetables, oz. 6
Beef Soup Meat, oz.. 8	Potatoes, oz..... 6	

Tea.

Tea, pt..... 1	Bread, oz..... 6	Butter, oz..... ½
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Tuesday.—Breakfast.

Coffee, pt..... 1	Butter, oz..... ½	Molasses, gill.....0 32
Bread, oz..... 6	Hominy, boiled, oz.. 2	

Dinner.

Mutton or Beef Broth	Bread, oz..... 4	Other vegetables, oz. 6
pt..... 1	Potatoes, oz..... 6	Indian Pudding.
Mutton or Meat, oz.. 8		

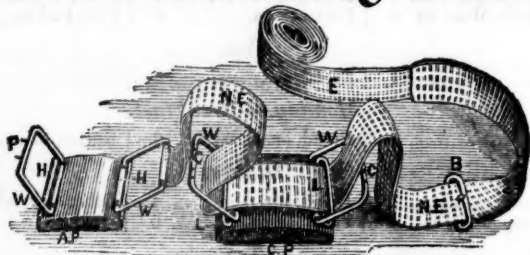
Tea.

Tea, pt..... 1	Bread, oz..... 6	Butter, oz..... ½
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There are also "Beef-tea diet," "Chicken diet," "Low diet," and "Milk diet," tables, which we cannot copy for want of space.

SPERMATORRHOEA.—Dr. Lafont-Gouzi publishes in the *Journal de Medecine et Chirurgie* the results of a careful clinical inquiry into the effects of some medicinal agents, represented as special sedatives of sexual erethism, with a view of discovering some means of allaying genital excitement and consequent spermatorrhœa. He thinks cauterization has been too highly extolled, though doubtless applicable and efficacious in rebellious cases; but in most instances the spermatorrhœa, being the result of a too morbid energy of the organs of generation, should be treated by measures less capable of inflicting injury. He found digitaline and luguline alike inefficacious, but was more successful with the bromide of potassium, two-thirds of his cases being either cured or greatly relieved by from 15 to 30 grains being administered in two doses every afternoon for a fortnight. —*Dublin Medical Press; American Med. Times.*

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